Pacific Marine Science Report 78-1

OCEANOGRAPHIC OBSERVATIONS AT OCEAN STATION P (50° N, 145° W)

Degrees

VOLUME 84

29 July - 14 September 1977

Offshore Oceanography Group

CANADA

INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
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ABSTRACT

Physical, chemical and biological oceanographic observations are made from the weathership at Ocean Weather Station Papa, and between Esquimalt and Station Papa, on a routine continuing basis. Physical oceanography data only are shown, including surface observations and profiles obtained with bottle casts and conductivity-temperature-pressure instruments.

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INTRODUCTION

Canadian operation of Ocean Weather Station P (Latitude 50°00'N, Longitude 145°00'W) was inaugurated in December, 1950. The station is occupied primarily to make meteorological observations of the surface and upper air and to provide an air-sea rescue service. The station is manned by two vessels operated by the Marine Services Branch of the Ministry of Transport. They are the CCGS Vancouver and the CCGS Quadra. Each ship remains on station for a period of six weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch.

Bathythermograph observations have been made at Station P since July 1952. A program of more extensive oceanographic observations commenced in August 1956. This was extended in April 1959, by the addition of a series of oceanographic stations along the route to and from station P and Swiftsure Bank. These stations are known as Line P stations. The number of stations on Line P has been increased twice and now consists of twelve stations (Fig. 1). Bathythermograph observations and surface salinity sample collections, in addition to being made on Line P oceanographic stations, are also made at odd meridians at 40', i.e. 139°40'W, 141°40'W, etc. These stations are known as Line P BT stations. Data observed prior to 1968 have been indexed by Collins et al (1969).

The present record includes hydrographic, continuously sampled STP and surface salinity and temperature data collected from the CCGS Quadra during the period 29 July to 14 September 1977.

All physical oceanographic data have been stored by the Canadian Oceanographic Data Centre (CODC), 615 Booth Street, Ottawa, Ontario, Canada. Requests for these data should be directed to CODC.

Biological and productivity data are published in the Manuscript Report series of the Fisheries Research Board of Canada (FRB), Pacific Biological Station, Nanaimo, British Columbia, Canada. Requests for these data should be directed to FRB.

Marine geochemical data are for the Ocean Chemistry Group, Ocean and Aquatic Sciences, Environment Canada, Institute of Ocean Sciences, P.O. Box 6000, Sidney, British Columbia, Canada, V8L 4B2.

PROGRAM OF OBSERVATION FROM CCGS QUADRA, 29 JULY - 14 SEPTEMBER 1977 (P-77-6) (CODC Ref. No. 15-77-006)

Oceanographic observations were made by Mr. T. Juhasz of Seakem Oceanography Ltd., Victoria, B.C. STD, XBT and CSP work was completed by the Mixed Layer Experiment (MILE) group (Offshore Oceanography personnel). Extra sampling and STD's done for MILE are not included in this report.

En Route to Station P

Line P Stations 1 to 12 were occupied and an STD profile made to near bottom or 1425 metres. Duplicate STD profiles were made at Stations 1 and 12. An additional STD profile was made for MILE at Station E101. Hydrocasts were cancelled due to an inoperable hydrowinch.

Samples for nitrate, nutrients, alkalinity and total CO_2 were collected at all whole stations from either a bucket or the seawater loop. Surface salinity samples were collected from both the seawater loop and a bucket at all whole stations and from the seawater loop at all half stations. Surface bucket temperature readings were taken at all whole stations.

Surface tarball tows were made at Stations 2, 6, 8, 10 and 12.

The surface temperature recorder, thermosalinograph, PCO_2 system and EDO depth sounder were run continuously.

Mechanical BT's or XBT's were taken at all whole and half stations.

On Station P

The oceanographic program was carried out as follows:

Physical Oceanography:

1) Profiles of salinity, temperature and oxygen were obtained from 3 hydrographic casts, 2 to 4200 metres and 1 to 1750. Extra profiles for salinity and temperature are included from chemical and biological hydrocasts.
2) 37 STP profiles (11 to 300 metres and 26 to 1425 metres) were obtained.
3) BT's or XBT's were taken every three hours to coincide with meteorological observations, encoded and transmitted according to the IGOSS format.
4) Salinity samples were collected daily at 0000 hrs GMT from the seawater loop (or from a bucket when the loop was not operational).
5) 142 STP profiles were obtained for MILE and are not included in this report.

Marine Geochemistry:

1) Nutrient and salinity samples were collected daily at 0000 hrs GMT from the seawater loop or bucket. Extra nutrient samples were taken every second day. Two profiles for nutrients to 500 m and one profile for

tritium to 500 m were taken. One bucket sample was also collected for tritium. A 24 hour nutrient series was completed, with a sample taken every hour.

3) 4 Pb^{210} rainwater samples were collected.

4) Air CO_2 samples were taken in quadruplicate at weekly intervals on Sundays, with duplicate samples taken on Thursdays.

5) 6 surface tarball tows were completed.

6) 3 seawater C-14 samples were taken from the seawater loop along with 3 seawater C-13 and 6 air C-13 samples.

7) PCO_2 carboys were filled every 3 days when the loop system was operational.

8) 6 samples for hydrocarbons were obtained.

Biological Observations:

Samples were obtained as follows:

1) 27 - 150 metre vertical plankton hauls
2 - 1200 metre vertical plankton hauls
Secchi disc readings were taken at local noon each week
2 groups of subsurface plankton hauls were taken on 3 consecutive nights at sunset.

2) 2 profiles to 200 metres for each of plant pigment and nitrate were obtained, as well as 6 surface samples for pigments and 3 surface samples for nitrates.

3) 2 profiles to 75 metres for chlorophyll a were obtained.

On August 17, 1977 an emergency run was made in response to a call for help from the freighter "Primrose". All recorders were run continuously. Substations were established and STD's and salinity samples taken for MILE. The ship returned to Station P on August 19, 1977.

On September 8, 1977 an emergency run was made to retrieve a marker buoy abandoned by the U.S. Hydrographic vessel "Oceanographer", involved in the MILE program. All recorders were run continuously. Substations were established and STD's and salinity samples taken for MILE.

En Route from Station P

Line P Stations 12 to 5 were occupied and an STD profile made to near bottom or 1425 metres. Stations 4 to 1 were cancelled due to rough weather. 8 additional STD profiles were made between Station P and 12 (Stations PP-01 to PP-08 for MILE. Hydrocasts were cancelled due to lack of time.

Samples for nitrate, nutrients, alkalinity and total CO_2 were collected at Station 12 to 5 from the seawater loop or a bucket. Surface salinity samples were collected at Stations 12 to 5 from both the seawater loop and a bucket. Surface salinity samples were also collected at Stations 11½ to 8½, 6½ and 5½ from the seawater loop. Surface bucket temperature readings were taken at Stations 12 to 5.

Surface tarball tows were taken at Stations 12, 10, 8 and 6.

The EDO depth sounder was run continuously. The surface temperature recorder, thermosalinograph and PCO_2 system were run continuously until Station 4, when they were shut down.

Mechanical BT's or XBT's were taken at all whole and half stations.

Observations for Other Agencies

1) Marine mammal observations were made by the ship's officers for Mr. I. McAskie, Fisheries Research Board of Canada, Pacific Biological Station, Nanaimo, British Columbia, Canada.

2) Bird observations were made by the ship's officers for Dr. M. Myres, University of Alberta, Calgary, Alberta, Canada and Mr. J. Guiguet, Curator of Birds and Mammals, Provincial Museum, Department of Provincial Secretary and Travel Industry, Victoria, British Columbia, Canada.

3) Air CO_2 samples were taken weekly in duplicate for Scripps Institution of Oceanography, La Jolla, California, U.S.A.

Data were processed for publication by Ms. M. Sainsbury of Seakem Oceanography Ltd., Victoria, B.C.

OBSERVATIONAL PROCEDURES

Observations for salinity, oxygen and temperature from all hydrographic casts, including the surface, were obtained with Niskin water sample bottles equipped with either Richter and Wiese and/or Yoshino Keiki Co. reversing thermometers. Two protected thermometers were used on all bottles and one unprotected thermometer was used on each bottle at depths of 300 m or greater. The accuracy of protected reversing thermometers is believed to be $\pm$ 0.02°C.

The daily surface water temperatures were measured from a bucket sample using a deck thermometer of $\pm$ 0.1°C accuracy. The daily surface salinity samples were obtained from the seawater loop. When the seawater loop was not operational these samples were obtained with a bucket, and are indicated with a 'b' in this data record.

Salinity determinations were made aboard ship with either an Autolab Model 601 Mark III inductive salinometer or a Hytech Model 6220 lab salinometer. Accuracy using duplicate determinations is estimated to be $\pm$ 0.003 ^{o}/oo.

Depth determinations were made using the "depth difference" method described in the U.S.N. Hydrographic Office Publication No. 607 (1955). Depth estimates have an approximate accuracy of $\pm$ 5 m for depths less than 1000 m, and $\pm$ 0.5% of depth for depths greater than 1000 m.

The dissolved oxygen analyses were done in the shipboard laboratory by a modified Winkler method (Carpenter, 1955).

Line P engine intake continuous temperature on both ships were recorded by a Honeywell Electronik 15 Recorder. The temperature probe is at a depth of approximately 3 metres below the sea surface and the instrument accuracy is believed to be $\pm$ 0.1°C.

Each ship is equipped with a Plessey Model 6600-T thermosalinograph which is used, on Line P, for continuous recording of surface temperatures and salinities from the ship's seawater loop. The temperature probe is mounted at the seawater loop intake (approximately 3 metres below the surface) and the salinity probe and recorder are situated in the dry lab. The accuracy of this instrument is believed to be ± 0.1°C for temperature and ± 0.1 °/oo for salinity.

STP profiles were taken with a Guildline Model 8700 STP system.

COMPUTATIONS

All hydrographic data were processed with the aid of an IBM 370 computer and a UNIVAC 1100 computer. Reversing thermometer temperature corrections, thermometric depth calculations and accepted depth from the "depth difference" method were computed. Extraneous thermometric depths caused by thermometer malfunctions were automatically edited and replaced. A Calcomp 565 Offline Plotter was used to plot temperature-salinity and temperature-oxygen diagrams, as well as plots of temperature, salinity and dissolved oxygen vs $\log_{10}$ depth. These plots were used to check the data for errors.

Missing hydrographic data were obtained using a weighted parabolas interpolation method (Reiniger and Ross, 1968). These data are indicated with an asterisk in this data record.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from punch card and magnetic tape records.

Analog records from the salinity-temperature-pressure instrument have been machine digitized, then replotted using the Calcomp plotter.

Digitization was continued until original and computer plotted traces were coincident. Temperature and salinity values were listed at standard pressure; integrals (depths, geopotential anomaly, and potential energy anomaly) were computed from the entire array of digitized data.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/kg)
POT EN	is potential energy in units of 10^8 ergs/cm^2
OXY	is the concentration of dissolved oxygen expressed in millilitres per litre
SOUND	is the velocity of sound in m/sec

REFERENCES

Carpenter, J.H., 1965. The Chesapeake Bay Institute technique for the Winkler dissolved oxygen method. Limnol. and Oceanogr. 10: 141-143.

Collins, C.A., R.L. Tripe, D.A. Healey and J. Joergensen, 1969. The time distribution of serial oceanographic data from the Ocean Station P programme. Fish. Res. Bd. Can. Tech. Rept. No. 106.

MacNeill, M., 1977. A study of anomalous salinity and oxygen values in the deep water at Ocean Station P from 1960-1976 (unpublished manuscript). Pacific Marine Science Report 77-9.

Reiniger, R.F. and C.K. Ross, 1968. A method of interpolation with application to oceanographic data. Deep Sea Res. 15: 185-193.

U.S.N. Hydrographic Office, 1955. Instruction Manual for oceanographic observations, Publ. No. 607.

LOG OF HYDROGRAPHIC AND STD OBSERVATIONS

CONSEC. #	POSITIONS	DATE (Z)	TIME (Z)	STD (m)	HYDROCASTS (m)	COMMENTS
001	125-33°W	29/07/77	2241	100		
002	125-33°W	29/07/77	2250	100		
003	126-00°W	30/07/77	0026	95		
004	126-40°W	30/07/77		270		
005	127-40°W	30/07/77	0725	1,400		
006	128-40°W	30/07/77	1015	800		
007	130-40°W	30/07/77	1719	1,200		
008	132-40°W	31/07/77	0043	1,400		
009	134-40°W	31/07/77	0650	1,420		
010	136-40°W	31/07/77	1339	1,420		
011	138-40°W	31/07/77	1950	1,420		
012	140-40°W	01/08/77	0223	1,420		
013	142-40°W	01/08/77	0828	300		
014	142-40°W	01/08/77	0843	1,420		
015	E101	01/08/77	1734	1,420		
016	P	02/08/77	0923	900		
017	P	02/08/77	1923	1,420		
018	P	03/08/77	0326	1,420		
019	P	03/08/77	1740		500	T,S, Tritium, Nutrients
020	P	03/08/77	1834	310		
021	P	04/08/77	0315	1,420		
022	P	04/08/77	1719	300		
023I	P	04/08/77	1730		600	T, O_2, S
024	P	04/08/77	1845		500	T, O_2, S, Alk., Total CO_2
025	P	04/08/77	2027	310		
026	P	05/08/77	0153	310		
027	P	05/08/77	1720	300		
023II	P	05/08/77	1730		1,750	T, O_2, S
028	P	06/08/77	0255	300		
029	P	06/08/77	1721	300		
030	P	08/08/77	0254	310		
031	P	08/08/77	1723	300		
032	P	08/08/77	1915		75	T, S, Chlor-a
033	P	09/08/77	0253	300		
034	P	09/08/77	1720	300		
035	P	09/08/77	1800		200	T, S, Pigment, Nitrates
036	P	10/08/77	1724	1,420		
037	E101	11/08/77	0107	1,420		
038	W101	11/08/77	0930	1,420		
039	P	11/08/77	1720	1,420		
040	P	11/08/77	1910		3,000	T, S, Alkalinity
041	P	11/08/77	2112	300		
042	P	12/08/77	0244	310		
043	P	12/08/77	1712	310		

CONSEC. #	POSITIONS	DATE (Z)	TIME (Z)	STD (m)	HYDROCASTS (m)	COMMENTS
044	P	12/08/77	2050		3,000	T, S, Alk., Trace Metals
044A	P	13/08/77	0243	310		
045	P	13/08/77	1715	300		
046	P	13/08/77	1750		500	T, S, Nutrient
047	P	14/08/77	0247	300		
048	P	14/08/77	1706	300		
049	P	14/08/77	1800		75	T, S, Chlor-a
050	P	15/08/77	0239	310		
051	P	15/08/77	1721	300		
052	P	15/08/77	1815		200	T, S, Pigment, Nitrates
053	P	16/08/77	0247	300		
054	P	16/08/77	1705	1,420		
055	E101	17/08/77	0132	1,420		
056	W101	17/08/77	0932	1,420		
057	P	17/08/77	1710	1,420		
058	KOD1	18/08/77	2224	310		
059	KOD2	19/08/77	0236	300		
060	KOD3	19/08/77	0850	310		
061	KOD4	19/08/77	1200	310		
062	KOD5	19/08/77	1445	315		
063	KOD6	19/08/77	1742	310		
064	KOD7	19/08/77	2032	310		
065	KOD8	19/08/77	2232	310		
066	P	20/08/77	0105	310		
067	P	20/08/77	1717	1,420		
068I	P	20/08/77	1900		600	T, S, O_2, Alk.
069	P	21/08/77	0250	310		
070	P	21/08/77	1714	300		
068II	P	21/08/77	1725		4,200	T, S, O_2, Alk.
071	P	22/08/77	0248	310		
072	P	22/08/77	1843	300		
073	P	23/08/77	1720	200		
074	P	23/08/77	2031	160		
075	P	23/08/77	2355	165		
076	P	24/08/77	0255	310		
077	P	24/08/77	0644	310		
078	P	24/08/77	0829	310		
079	P	24/08/77	1452	300		
080	P	24/08/77	1713	1,420		
081	P	24/08/77	1815		500	T, S, O_2, Alk. Total CO_2
082	E3	24/08/77	2056	210		
083	E4	24/08/77	2306	210		
084	E101	25/08/77	0107	1,420		
085	S8	25/08/77	0409	210		
086	S7	25/08/77	0536	210		

CONSEC. #	POSITIONS	DATE (Z)	TIME (Z)	STD (m)	HYDROCASTS (m)	COMMENTS
087	W101	25/08/77	0736	1,420		
088	W4	25/08/77	1004	210		
089	W3	25/08/77	1300	300		
090	P	25/08/77	1714	1,420		
091	P	25/08/77	1820		3,000	T, S, Trace Metals
091A	P	25/08/77	2028	300		
092	P	26/08/77	0000	310		
093	P	26/08/77	0247	310		
094	P	26/08/77	0549	310		
095	P	26/08/77	0843	310		
096	P	26/08/77	1450	310		
097	P	26/08/77	1720	1,420		
098	P	26/08/77	2358	310		
099	P	27/08/77	0250	310		
100	P	27/08/77	0600	310		
101	P	27/08/77	0823	310		
102	P	27/08/77	1453	310		
103	P	27/08/77	1717	310		
104	P	28/08/77	0132	310		
105	P	28/08/77	0609	310		
106	P	28/08/77	0837	310		
107	P	28/08/77	1453	310		
108	P	28/08/77	1715	failed		
109	P	28/08/77	1953	300		
110	P	28/08/77	2347	310		
111	P	29/08/77	0251	310		
112	P	29/08/77	0558	300		
113	P	29/08/77	0830	300		
114	P	29/08/77	1453	300		
115	P	29/08/77	1716	310		
116	P	29/08/77	2023	300		
117	E3	29/08/77	2355	300		
118	E4	30/08/77	0218	300		
119	E101	30/08/77	0410	1,420		
120	S8	30/08/77	0656	failed		
121	S8	30/08/77	0735	300		
122	C1	30/08/77	0912	300		
123	S7	30/08/77	1133	300		
124	W101	30/08/77	1344	300		
125	W4	30/08/77	1611	300		
126	W3	30/08/77	1840	300		
127	P	30/08/77	2034	300		
128	P	30/08/77	2346	300		
129	P	31/08/77	0256	300		
130	P	31/08/77	0603	300		
131	P	31/08/77	0835	300		
132	P	31/08/77	1452	300		
133	P	31/08/77	1721	300		
134	P	31/08/77	2029	300		

CONSEC. #	POSITIONS	DATE (Z)	TIME (Z)	STD (m)	HYDROCASTS (m)	COMMENTS
135	P	01/09/77	0000	300		
136	P	01/09/77	0318	300		
137	P	01/09/77	1718	300		
138	P	01/09/77	2035	300		
139	P	01/09/77	2350	300		
140	P	02/09/77	0252	300		
141	P	02/09/77	0559	300		
142	P	02/09/77	0842	300		
143	P	20/09/77	1456	300		
144I	P	02/09/77	1710		600	T, S, O_2, Alk.
145	P	02/09/77	1805	1,200		
144II	P	02/09/77	1900		4,200	T, S, O_2, Alk.
146	W3	02/09/77	2341	300		
147	W4	03/09/77	0134	300		
148	W101	03/09/77		1,420		
149	S7	03/09/77	0550	300		
150	C1	03/09/77	0755	300		
151	S8	03/09/77	0937	300		
152	E101	03/09/77	1134	1,420		
153	E4	03/09/77		300		
154	E3	03/09/77		300		
155	P	03/09/77	1736	300		
156	P	03/09/77	2031	300		
157	P	03/09/77	2347	300		
158	P	04/09/77	0256	300		
159	P	04/09/77	0602	300		
160	P	04/09/77	0840	300		
161	P	04/09/77	1454	300		
162	P	04/09/77	1714	300		
163	P	04/09/77	2034	300		
164	P	04/09/77	2349	300		
165	P	05/09/77	0300	300		
166	P	05/09/77	0559	300		
167	P	05/09/77	0832	300		
168	P	05/09/77	1452	300		
169	P	05/09/77	1728	300		
170	P	05/09/77	2043	300		
171	P	05/09/77	2349	300		
172	P	06/09/77	0253	300		
173	P	06/09/77	0604	300		
174	P	06/09/77	0833	300		
175	P	06/09/77	1452	300		
176	P	06/09/77	1720	300		
177	P	06/09/77	2032	300		
178	P	06/09/77	2048	300		
179	P	07/09/77	0257	300		
180	P	07/09/77	0557	300		
181	P	07/09/77	0833	300		
182	P	07/09/77	1512	300		

CONSEC. #	STATION	DATE (Z)	TIME (Z)	STD (m)	HYDROCASTS (m)	COMMENTS
183	P	07/09/77	1719	300		
184	N8	07/09/77	2009	300		
185	NC	07/09/77	2152	300		
186	N7	08/09/77	0015	300		
187	N101	08/09/77	0306	1,420		
188	NW4	08/09/77	0534	300		
189	NW3	08/09/77	0754	300		
190	NPAP	08/09/77	0807	1,420		
191	NE3	08/09/77	1219	300		
192	NE4	08/09/77	1418	300		
193	P	08/09/77	1717	1,420		
194	P	08/09/77	2028	300		
195	C1	09/09/77	0151	300		
196	E4	09/09/77	0351	300		
197	E101	09/09/77	0557	1,420		
198	S8	09/09/77	0841	300		
199	S7	09/09/77	1140	300		
200	W101	09/09/77	1409	1,420		
201	W4	09/09/77	1710	300		
202	W3	09/09/77	1916	300		
203	E3	09/09/77	2130	300		
204	P	09/09/77	2353	1,420		
205	P	10/09/77	0550	300		
206	P	10/09/77	0559	300		
207	P	10/09/77	1713	300		
208	P	10/09/77	2348	300		
209	P	11/09/77	0319	300		
210I	PP01	11/09/77	0504	300		
210II	PP02	11/09/77	0636	300		
211	PP03	11/09/77	0804	300		
212	PP04	11/09/77	0953	300		
213	PP05	11/09/77	1126	300		
214	PP06	11/09/77	1317	300		
215	PP07	11/09/77	1427	300		
216	PP08	11/09/77	1553	300		
217	142-40°W	12/09/77	2100	1,420		
218	140-40°W	12/09/77	0612	300		
219	138-40°W	12/09/77	1205	1,420		
220	136-40°W	12/09/77	1830	300		
221	134-40°W	13/09/77	0041	1,200		
222	132-40°W	13/09/77	0751	300		
223	130-40°W	13/09/77		1,420		
224	128-40°W	13/09/77		300		

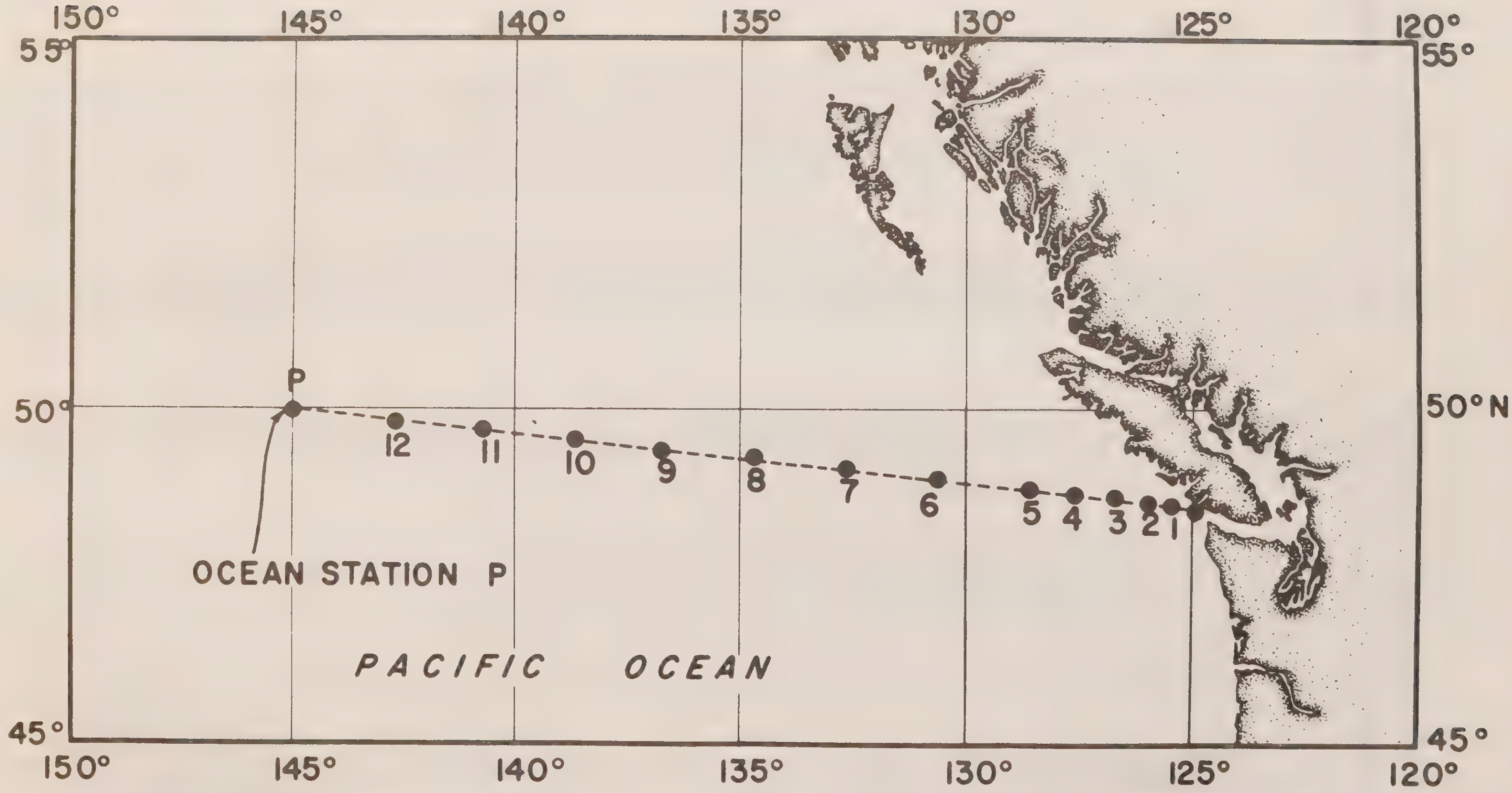


Fig. 1 Chart showing Line P station positions.

Oceanographic Data Obtained on Cruise P-77-6

(CODC Reference No. 15-77-006)

Results of Hydrographic Observations

(P-77-6)

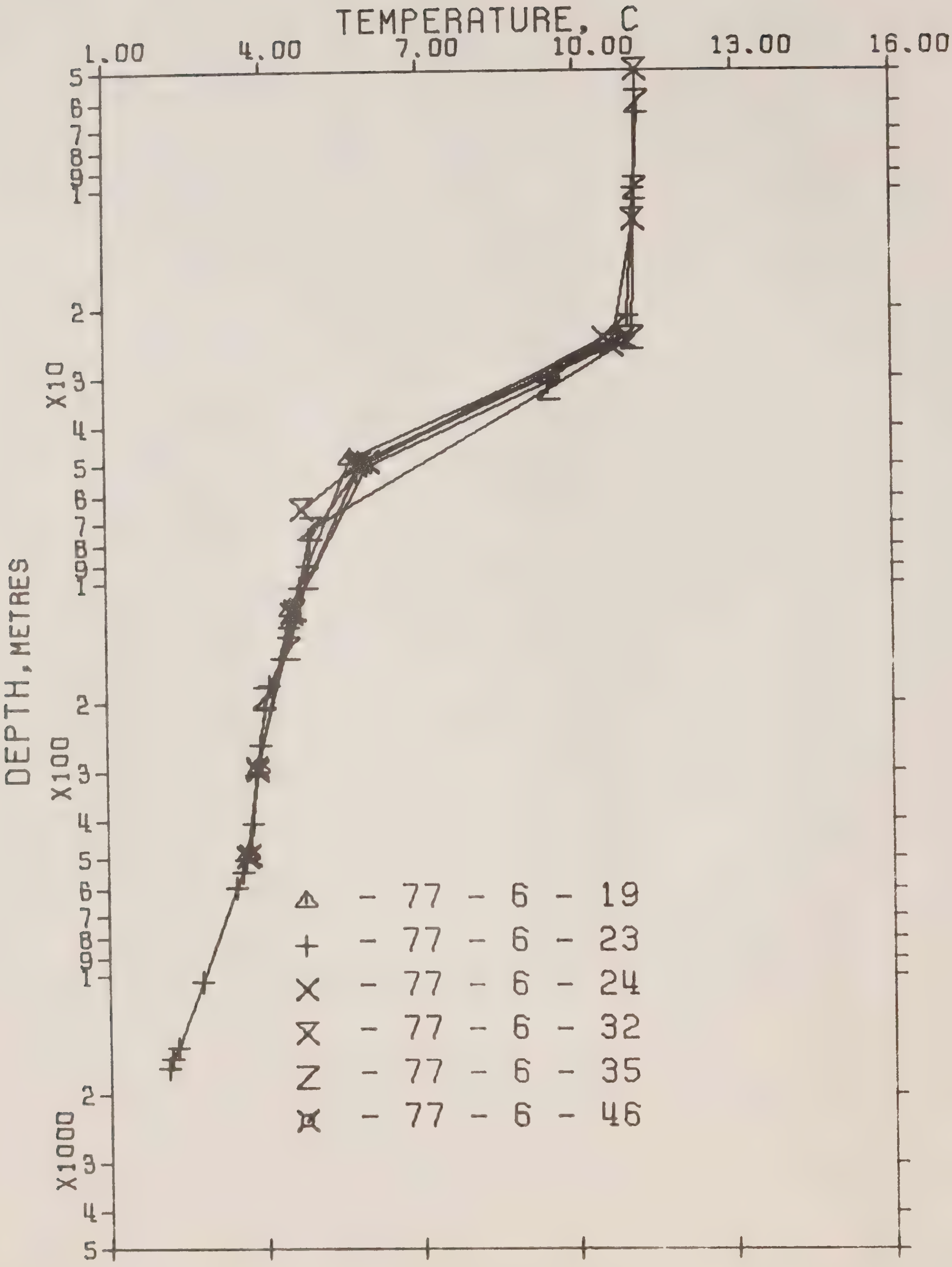


Figure 2. Composite plot of temperature vs $\log_{10}$ depth for Station P. P-77-6.

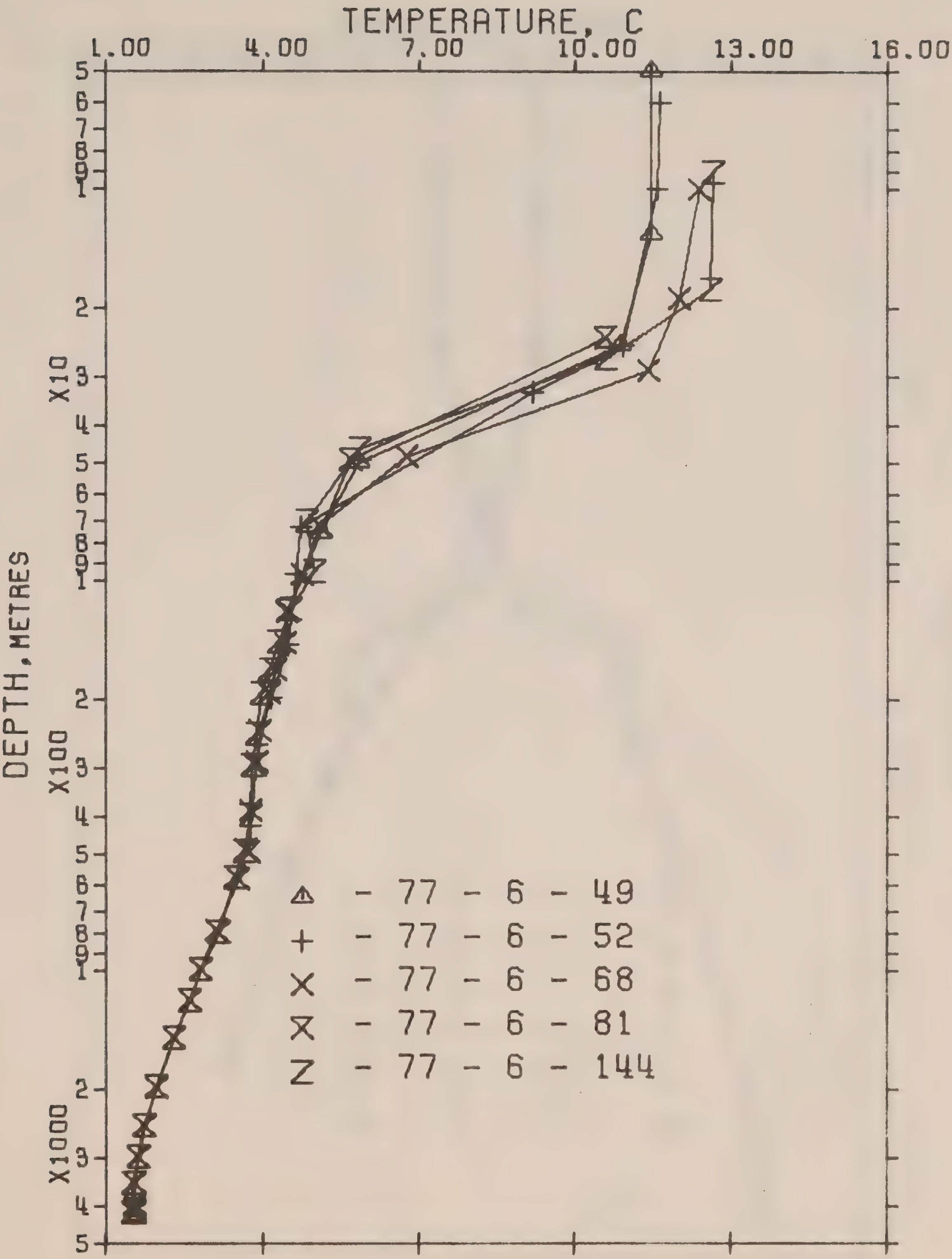


Figure 2. (Continued)
Composite plot of temperature vs $\log_{10}$ depth for Station P. P-77-6.

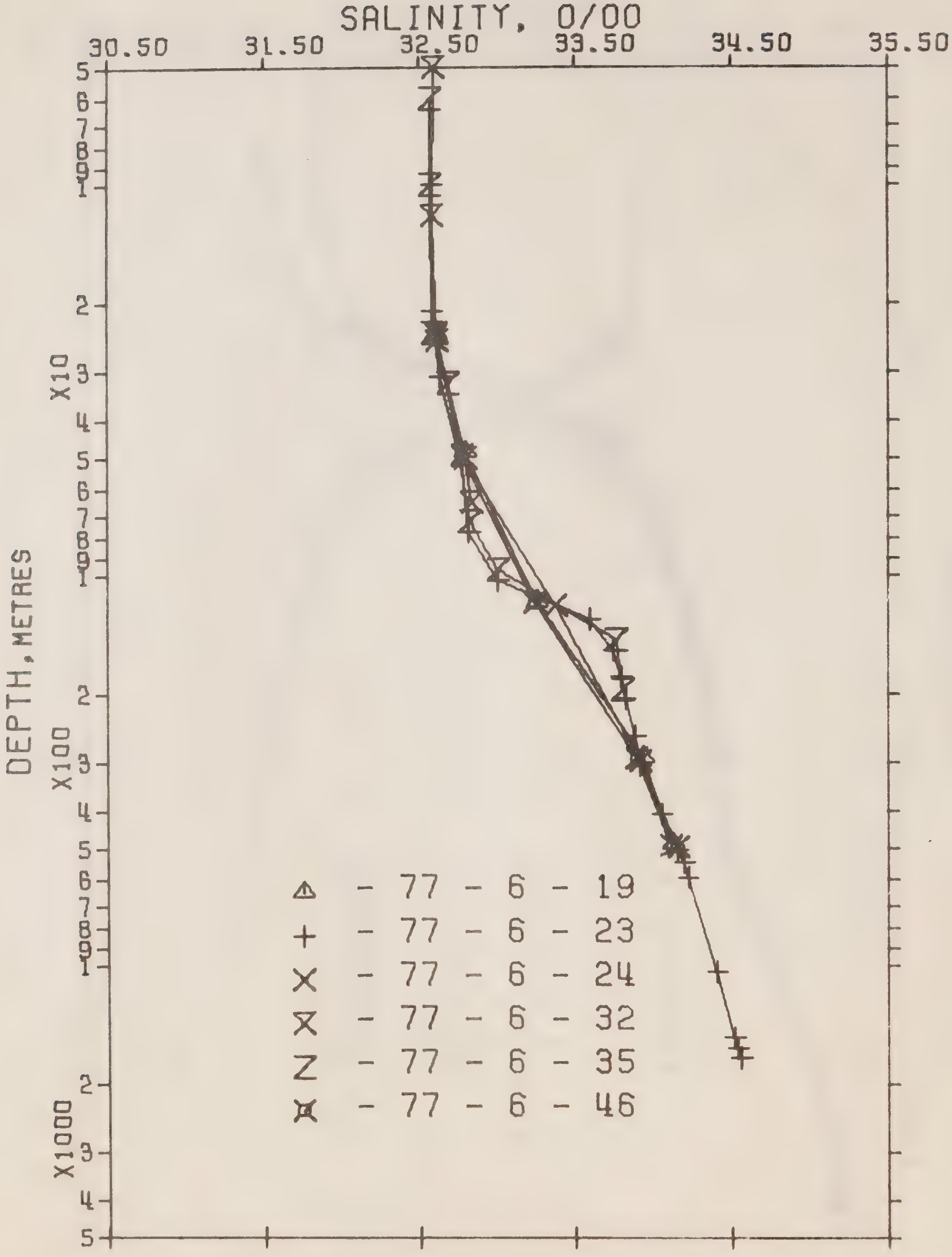


Figure 3. Composite plot of salinity vs $\log_{10}$ depth for Station P. P-77-6.

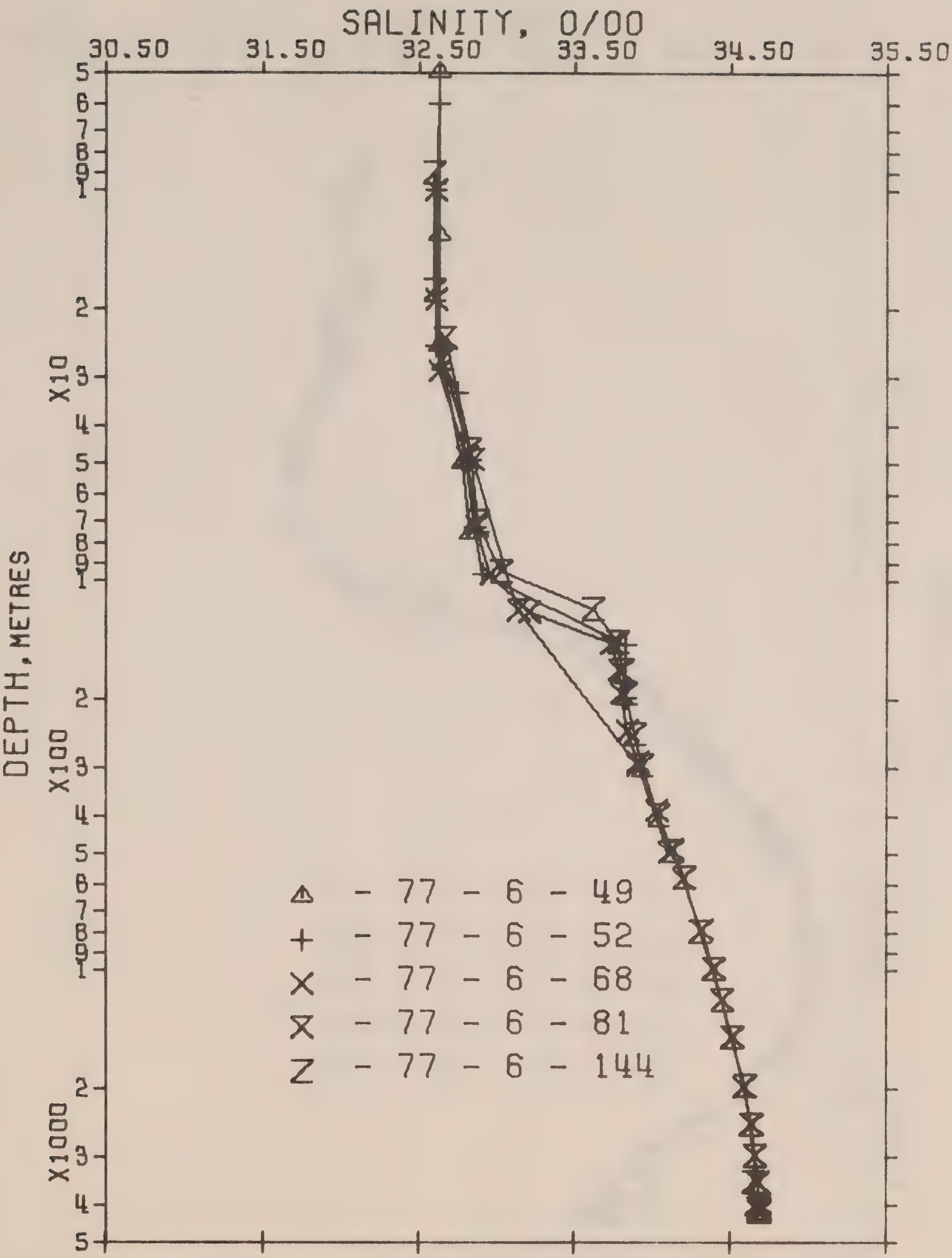


Figure 3. (Continued)
Composite plot of salinity vs $\log_{10}$ depth for Station P. P-77-6.

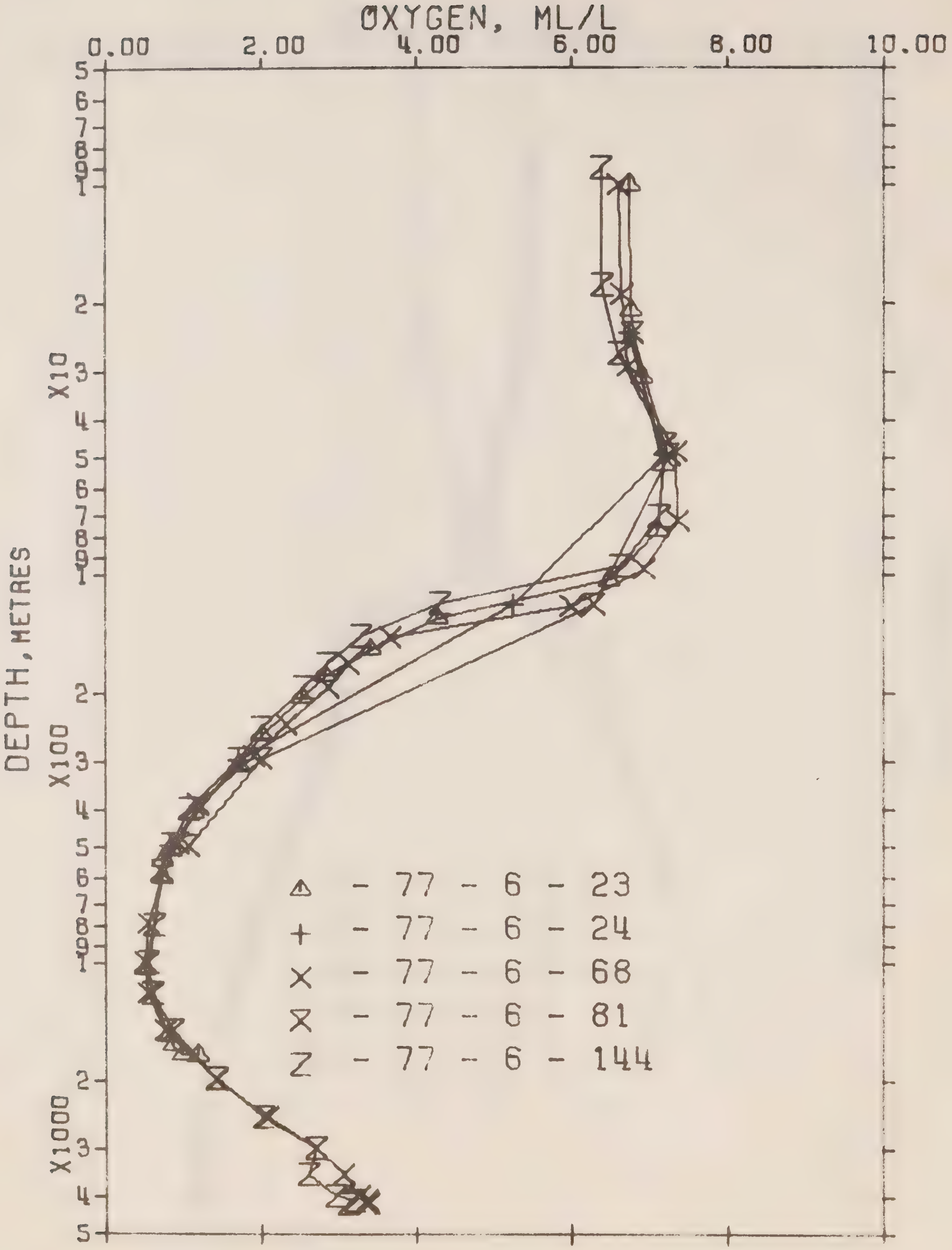
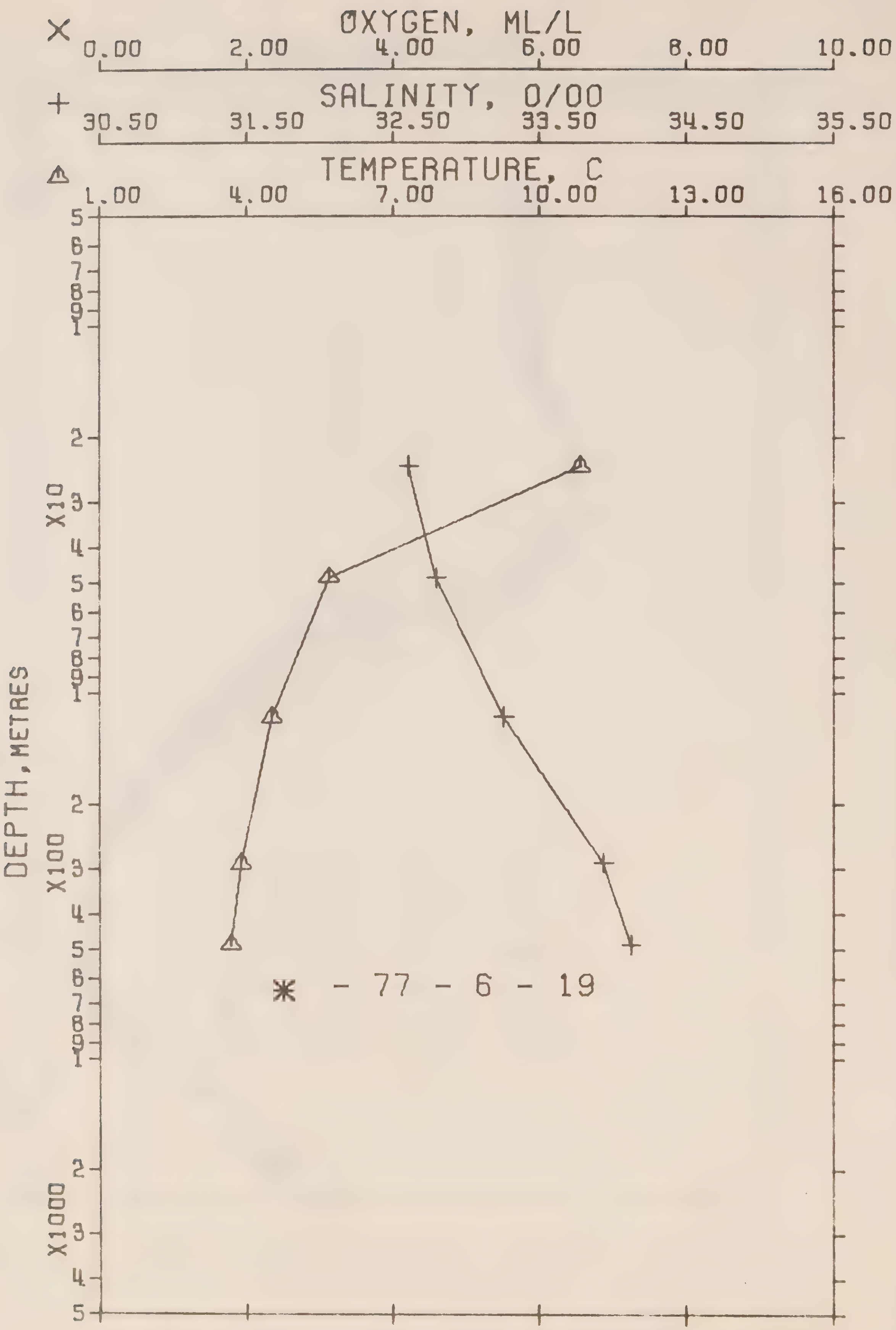


Figure 4. Composite plot of oxygen vs $\log_{10}$ depth for Station P. P-77-6.


OXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
SALINITY, O/OO
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 19

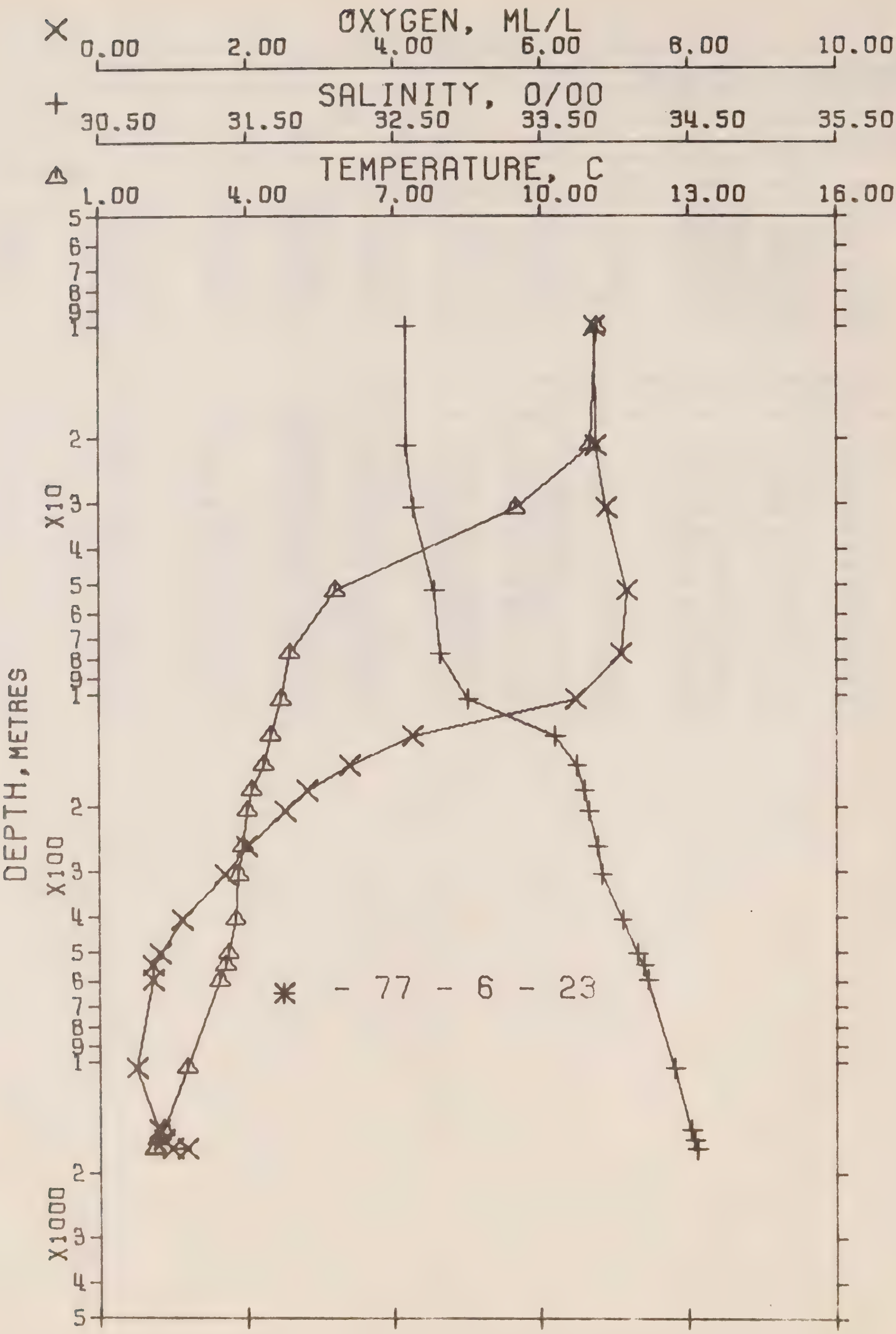
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 19 DATE 3/ 8/77 GMT 17.9
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.02	32.599	0	24.927	303.6	11.02	303.6	.00	.00		1491.
24	10.85	32.606	24	24.963	300.7	10.85	300.2	.73	.09		1491.
48	5.68	32.796	48	25.876	213.9	5.68	213.3	1.34	.31		1472.
117	4.51	33.256	116	26.371	167.3	4.50	166.2	2.62	1.37		1469.
293	3.89	33.939	291	26.977	111.3	3.87	108.7	5.00	6.20		1470.
489	3.67	34.133	485	27.153	96.0	3.64	91.9	7.02	14.19		1472.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.02	32.599	0	24.927	303.6	11.02	303.6	.00	.00		1491.
10	10.89	32.604	10	24.954	301.3	10.89	301.1	.30	.02		1491.
20	10.86	32.606	20	24.961	300.8	10.86	300.4	.60	.06		1491.
30	9.24	32.665	30	25.278	270.8	9.24	270.2	.90	.14		1485.
50	5.63	32.814	50	25.895	212.0	5.63	211.5	1.38	.33		1472.
75	5.10	33.025	75	26.124	190.5	5.09	189.8	1.88	.65		1470.
100	4.72	33.175	99	26.285	175.4	4.71	174.4	2.34	1.06		1469.
125	4.46	33.306	124	26.416	163.2	4.46	162.0	2.76	1.54		1469.
150	4.34	33.441	149	26.536	152.0	4.33	150.6	3.15	2.09		1469.
175	4.24	33.556	174	26.637	142.6	4.23	140.9	3.52	2.70		1469.
200	4.15	33.655	199	26.725	134.4	4.13	132.6	3.87	3.36		1469.
225	4.07	33.742	223	26.803	127.3	4.05	125.2	4.19	4.07		1469.
250	4.00	33.821	248	26.872	120.9	3.98	118.6	4.50	4.82		1469.
300	3.88	33.948	298	26.985	110.6	3.86	107.9	5.08	6.43		1470.
400	3.76	34.057	397	27.084	101.9	3.73	98.5	6.14	10.21		1471.


ØXYGEN, ML/L
0.00
2.00
4.00
6.00
8.00
10.00
SALINITY, 0/00
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 23

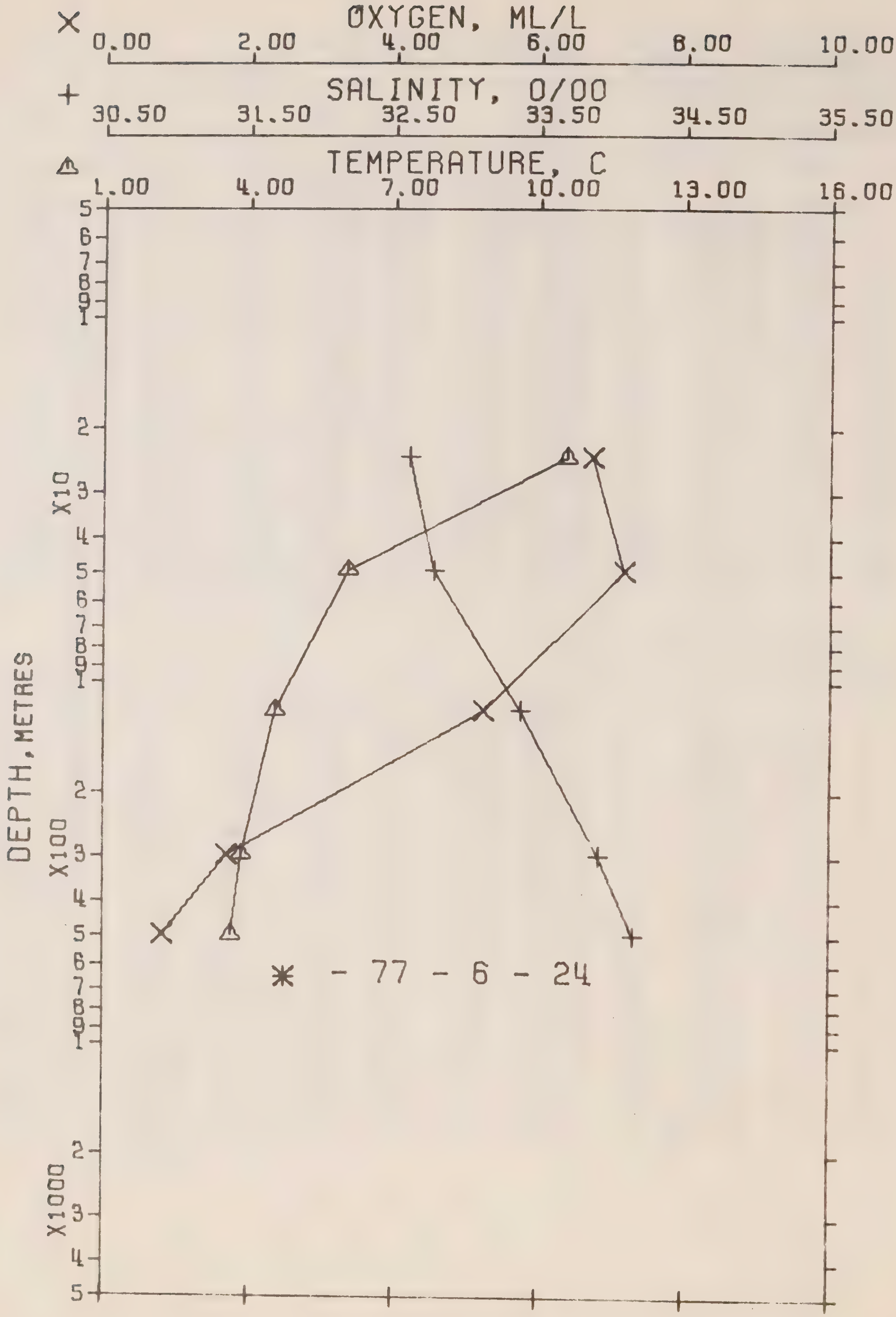
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 23 DATE 4/ 8/77 GMT 18.0
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.04	32.534	0	24.873	308.7	11.04	308.7	.00	.00	6.71	1491.
10	11.15	32.593	10	24.900	306.4	11.15	306.2	.31	.02	6.74	1492.
21	11.01	32.592	21	24.924	304.4	11.01	303.9	.65	.07	6.76	1491.
31	9.50	32.637	31	25.214	276.9	9.50	276.3	.94	.15	6.90	1486.
52	5.79	32.776	52	25.847	216.7	5.79	216.1	1.46	.37	7.18	1472.
77	4.87	32.823	77	25.990	203.2	4.86	202.5	1.98	.71	7.10	1469.
104	4.68	33.013	103	26.161	187.2	4.67	186.2	2.49	1.18	6.49	1469.
130	4.48	33.600	129	26.647	141.4	4.47	140.1	2.92	1.69	4.26	1469.
156	4.33	33.752	155	26.783	128.6	4.32	127.1	3.27	2.20	3.41	1469.
182	4.08	33.797	181	26.845	122.9	4.07	121.3	3.59	2.77	2.82	1469.
207	4.01	33.829	206	26.877	120.0	4.00	118.2	3.90	3.37	2.52	1469.
259	3.90	33.888	257	26.935	114.9	3.88	112.6	4.50	4.81	2.00	1469.
310	3.83	33.919	308	26.967	112.3	3.81	109.6	5.09	6.50	1.70	1470.
410	3.76	34.064	407	27.089	101.5	3.73	98.0	6.15	10.41	1.12	1471.
508	3.61	34.162	504	27.182	93.4	3.57	89.1	7.11	14.87	.82	1472.
547	3.54	34.196	542	27.216	90.4	3.50	85.9	7.46	16.76	.72	1473.
602	3.44	34.228	597	27.251	87.4	3.40	82.5	7.95	19.65	.72	1473.
1043	2.76	34.408	1033	27.457	69.7	2.69	62.8	11.38	48.09	.49	1478.
1542	2.28	34.521	1525	27.588	58.6	2.18	50.2	14.55	89.78	.80	1484.
1642	2.18	34.544	1623	27.614	56.2	2.07	47.6	15.13	99.04	.87	1485.
1732	2.11	34.559	1712	27.632	54.7	1.99	45.9	15.63	107.64	.98	1487.
1742	2.11	34.561	1722	27.633	54.6	1.99	45.8	15.68	108.62	1.18	1487.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.04	32.534	0	24.873	308.7	11.04	308.7	.00	.00	6.71	1491.
10	11.15	32.593	10	24.900	306.4	11.15	306.2	.31	.02	6.74	1492.
20	11.02	32.592	20	24.922	304.5	11.02	304.1	.61	.06	6.75	1491.
30	9.65	32.633	30	25.186	279.5	9.65	278.9	.91	.14	6.88	1487.
50	6.11	32.764	50	25.797	221.4	6.11	220.8	1.41	.34	7.16	1473.
75	4.95	32.819	75	25.978	204.3	4.94	203.6	1.93	.67	7.10	1469.
100	4.70	32.990	99	26.140	189.2	4.70	188.2	2.42	1.11	6.56	1469.
125	4.51	33.501	124	26.565	149.1	4.50	147.9	2.85	1.60	4.63	1469.
150	4.36	33.719	149	26.754	131.4	4.35	129.9	3.19	2.07	3.59	1469.
175	4.15	33.785	174	26.829	124.4	4.13	122.8	3.50	2.60	2.97	1469.
200	4.03	33.820	199	26.868	120.8	4.02	119.0	3.61	3.19	2.60	1469.
225	3.97	33.851	224	26.899	118.1	3.95	116.1	4.11	3.83	2.33	1469.
250	3.92	33.879	248	26.926	115.7	3.90	113.5	4.40	4.54	2.08	1469.
300	3.84	33.913	298	26.961	112.8	3.82	110.2	4.97	6.14	1.76	1470.
400	3.77	34.051	397	27.078	102.5	3.74	99.0	6.05	9.98	1.17	1471.
500	3.62	34.155	496	27.175	94.0	3.59	89.8	7.03	14.47	.85	1472.
600	3.44	34.227	595	27.249	87.5	3.40	82.6	7.93	19.54	.72	1473.
700	3.25	34.277	694	27.308	82.5	3.21	77.1	8.78	25.16	.66	1474.
800	3.09	34.321	793	27.358	78.1	3.03	72.3	9.59	31.29	.60	1475.
900	2.94	34.360	892	27.402	74.3	2.88	68.1	10.35	37.90	.55	1476.
1000	2.81	34.394	990	27.441	71.0	2.74	64.3	11.07	44.93	.51	1477.
1200	2.59	34.448	1188	27.504	65.7	2.51	58.3	12.44	60.20	.61	1480.
1500	2.31	34.513	1484	27.578	59.4	2.21	51.1	14.31	85.93	.78	1484.



ØXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 24

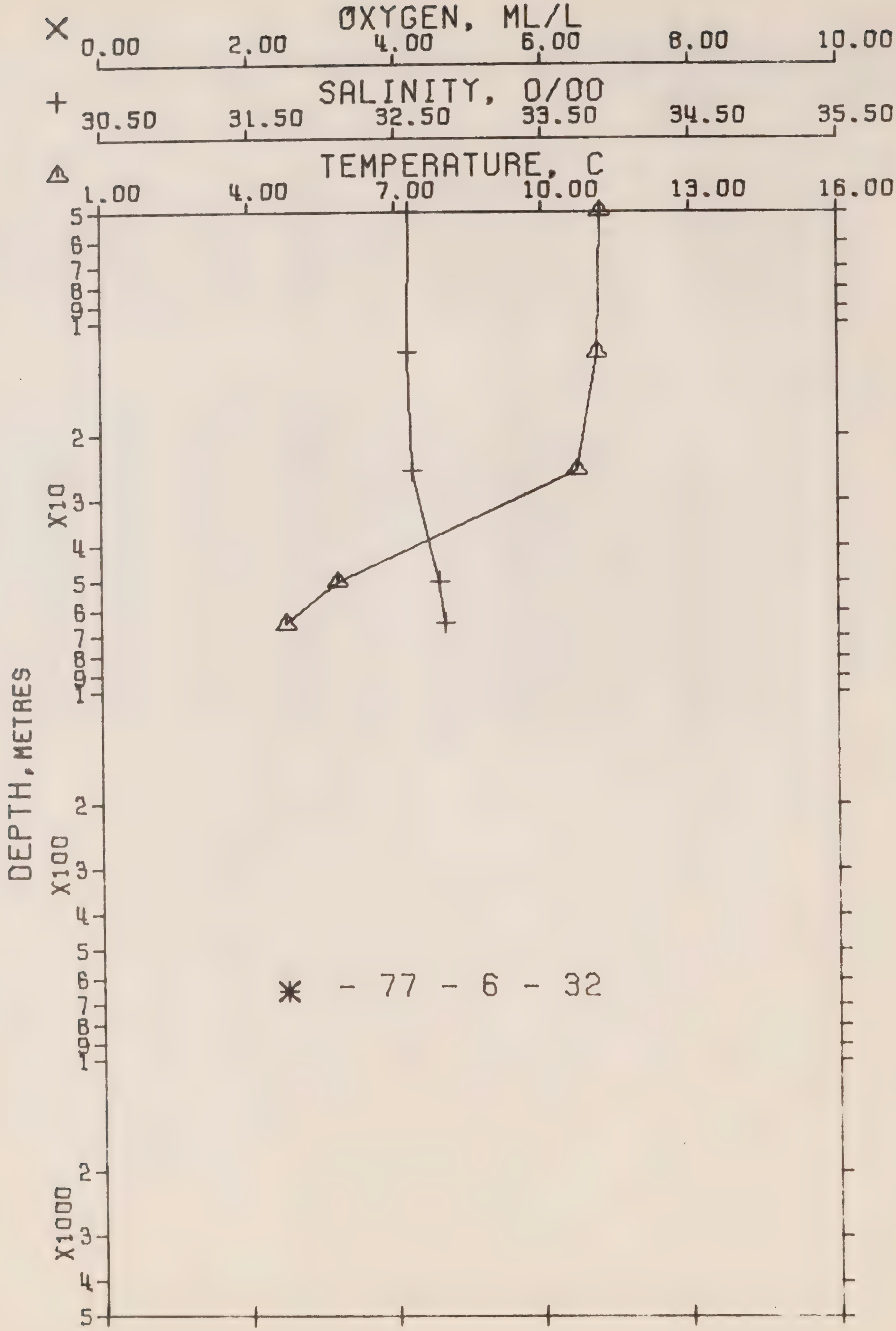
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 24 DATE 4/ 8/77 GMT 19.0
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.09	32.534	0	24.865	309.6	11.09	309.6	.00	.00	6.71	1491.
24	10.58	32.612	24	25.014	295.8	10.58	295.3	.72	.09	6.75	1490.
49	6.05	32.776	49	25.815	219.7	6.05	219.1	1.36	.32	7.18	1473.
120	4.54	33.384	119	26.469	158.1	4.53	156.9	2.66	1.42	5.23	1469.
300	3.85	33.919	298	26.965	112.4	3.83	109.8	5.04	6.38	1.70	1470.
501	3.64	34.162	497	27.179	93.7	3.60	89.4	7.09	14.71	.82	1472.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.09	32.534	0	24.865	309.6	11.09	309.6	.00	.00	6.71	1491.
10	10.71	32.592	10	24.976	299.1	10.71	298.9	.30	.02	6.74	1490.
20	10.61	32.608	20	25.006	296.5	10.61	296.1	.60	.06	6.74	1490.
30	9.21	32.662	30	25.279	270.6	9.21	270.0	.89	.13	6.88	1485.
50	6.03	32.786	50	25.826	218.7	6.02	218.1	1.38	.33	7.15	1473.
75	5.34	33.063	75	26.126	190.4	5.33	189.5	1.89	.66	6.26	1471.
100	4.85	33.260	99	26.338	170.5	4.84	169.4	2.34	1.06	5.63	1470.
125	4.51	33.409	124	26.492	155.9	4.50	154.7	2.75	1.52	5.07	1469.
150	4.37	33.515	149	26.591	146.8	4.36	145.4	3.12	2.05	4.37	1469.
175	4.26	33.604	174	26.674	139.1	4.24	137.5	3.48	2.64	3.78	1469.
200	4.16	33.682	199	26.746	132.5	4.14	130.6	3.82	3.29	3.26	1469.
225	4.07	33.751	223	26.810	126.6	4.05	124.6	4.14	3.99	2.81	1469.
250	3.99	33.812	248	26.866	121.4	3.97	119.2	4.45	4.74	2.41	1469.
300	3.85	33.919	298	26.965	112.4	3.83	109.8	5.04	6.38	1.70	1470.
400	3.73	34.055	397	27.085	101.8	3.70	98.4	6.11	10.19	1.21	1471.
500	3.64	34.161	496	27.178	93.7	3.61	89.5	7.08	14.66	.83	1472.


OXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 32

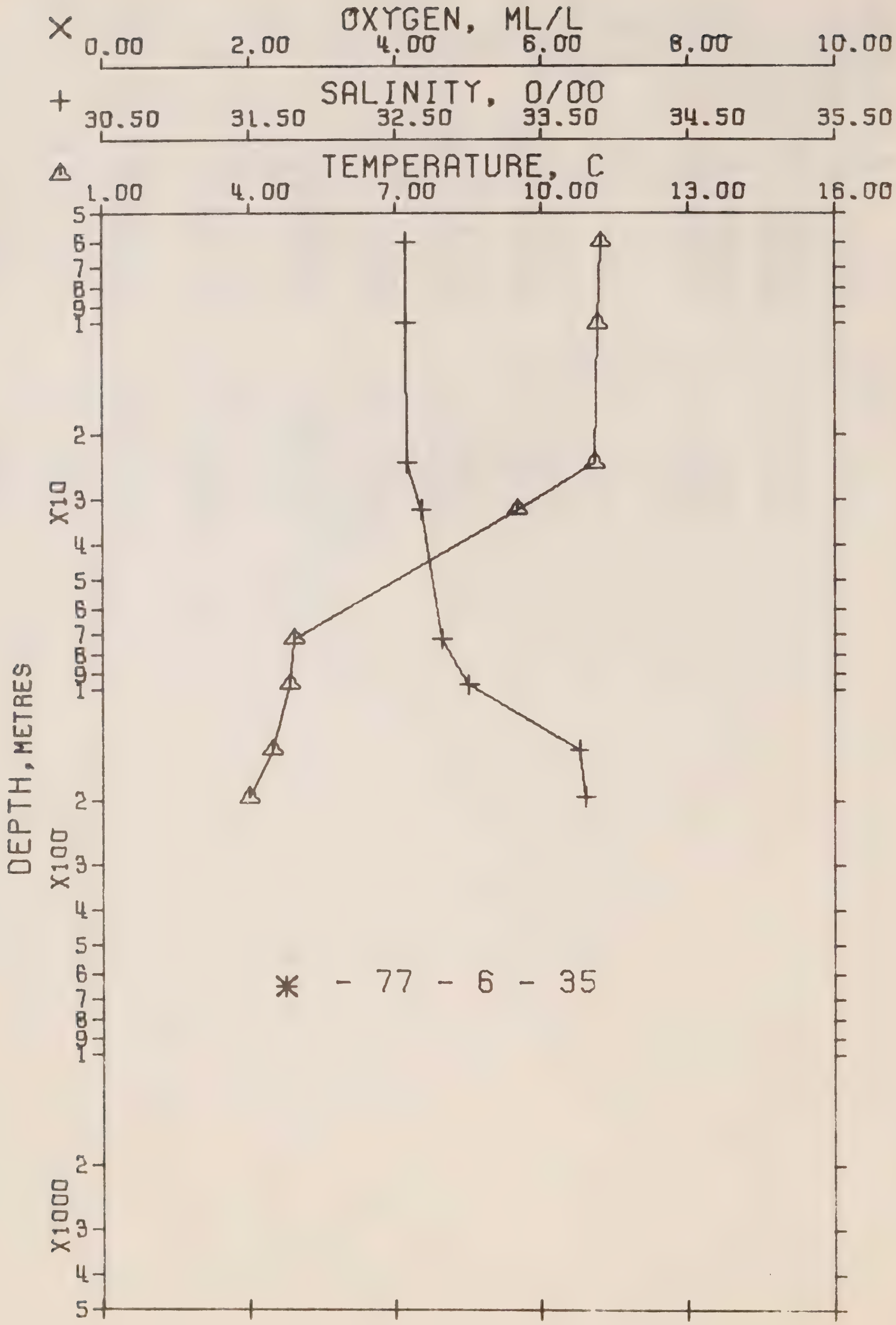
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 32 DATE 8/ 8/77 GMT 19.5
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.22	32.606	0	24.897	306.4	11.22	306.4	.00	.00		1492.
2	11.25	32.599	2	24.886	307.5	11.25	307.5	.06	.00		1492.
5	11.21	32.605	5	24.898	306.5	11.21	306.3	.15	.00		1492.
12	11.13	32.593	12	24.903	306.1	11.13	305.9	.37	.02		1492.
25	10.73	32.624	25	24.998	297.4	10.73	296.8	.77	.10		1490.
50	5.81	32.796	50	25.860	215.4	5.81	214.8	1.40	.34		1472.
65	4.75	32.841	65	26.017	200.5	4.75	199.9	1.71	.52		1468.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.22	32.606	0	24.897	306.4	11.22	306.4	.00	.00		1492.
10	11.15	32.596	10	24.902	306.2	11.15	306.0	.31	.02		1492.
20	10.86	32.614	20	24.968	300.1	10.85	299.7	.61	.06		1491.
30	9.49	32.668	30	25.240	274.4	9.48	273.8	.90	.14		1486.
50	5.81	32.796	50	25.860	215.4	5.81	214.8	1.40	.34		1472.



X OXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
+ SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
△ TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
✳ - 77 - 6 - 35

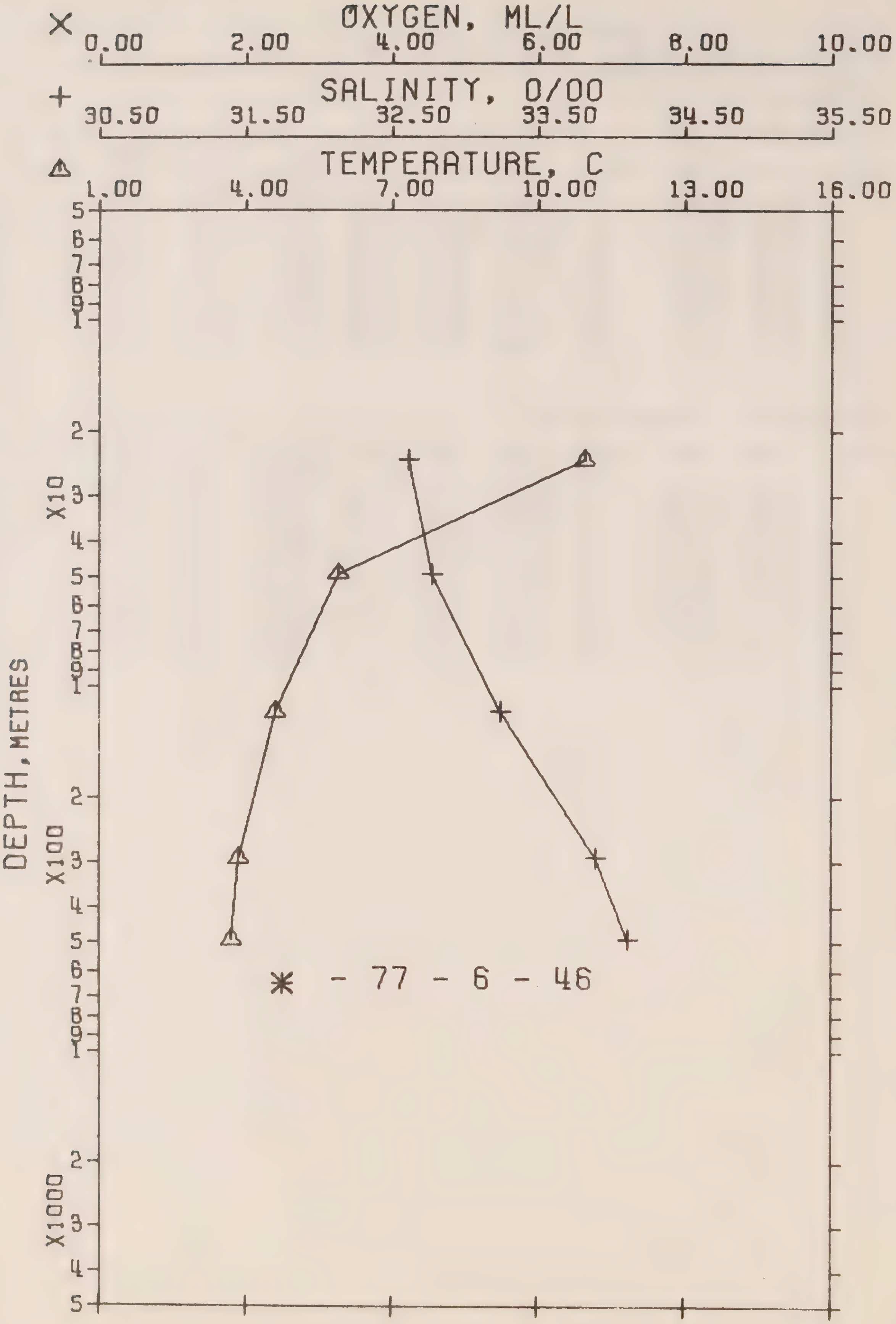
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 35 DATE 9/ 8/77 GMT 18.5
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.21	32.585	0	24.883	307.8	11.21	307.8	.00	.00		1492.
6	11.23	32.582	6	24.877	308.5	11.23	308.4	.19	.01		1492.
10	11.16	32.577	10	24.885	307.8	11.16	307.5	.31	.02		1492.
24	11.10	32.588	24	24.905	306.2	11.10	305.7	.74	.09		1492.
32	9.51	32.687	32	25.251	273.3	9.51	272.7	.98	.16		1486.
72	4.93	32.829	72	25.988	203.4	4.92	202.7	1.91	.65		1469.
97	4.85	33.015	96	26.144	188.8	4.84	187.8	2.39	1.06		1469.
146	4.47	33.767	145	26.780	128.9	4.46	127.4	3.16	2.01		1470.
197	3.99	33.812	196	26.866	121.0	3.98	119.2	3.61	3.13		1468.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.21	32.585	0	24.883	307.8	11.21	307.8	.00	.00		1492.
10	11.16	32.577	10	24.885	307.8	11.16	307.5	.31	.02		1492.
20	11.11	32.586	20	24.900	306.6	11.11	306.1	.62	.06		1492.
30	9.90	32.663	30	25.169	281.2	9.90	280.5	.91	.14		1488.
50	7.03	32.764	50	25.679	232.8	7.03	232.1	1.43	.35		1477.
75	4.92	32.851	75	26.007	201.6	4.91	200.9	1.96	.69		1469.
100	4.82	33.078	99	26.197	183.8	4.81	182.8	2.45	1.12		1469.
125	4.61	33.484	124	26.541	151.4	4.60	150.1	2.87	1.60		1469.
150	4.43	33.771	149	26.788	128.2	4.42	126.7	3.22	2.08		1469.
175	4.18	33.794	174	26.832	124.1	4.17	122.5	3.53	2.61		1469.



OXYGEN, ML/L
0.00 2.00 4.00 6.00 8.00 10.00
SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 46

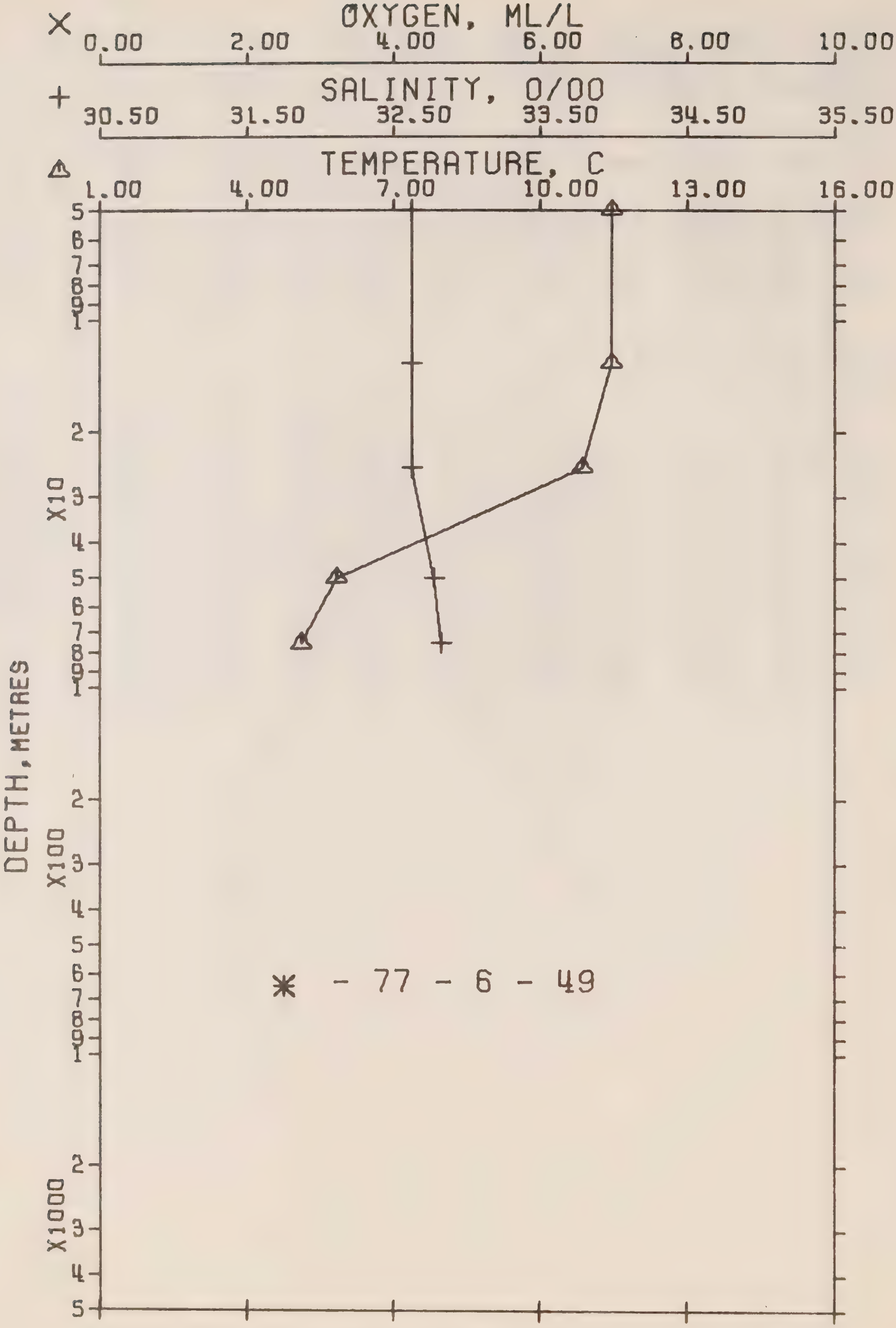
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 46 DATE 13/ 8/77 GMT 18.3
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.39	32.627	0	24.883	307.8	11.39	307.8	.00	.00		1492.
24	10.95	32.621	24	24.957	301.3	10.95	300.7	.73	.09		1491.
49	5.89	32.778	49	25.836	217.7	5.89	217.1	1.37	.33		1472.
118	4.60	33.249	117	26.356	168.8	4.59	167.7	2.67	1.41		1469.
296	3.84	33.896	294	26.948	114.0	3.82	111.4	5.12	6.43		1470.
495	3.69	34.121	491	27.141	97.2	3.66	92.9	7.20	14.78		1472.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.39	32.627	0	24.883	307.8	11.39	307.8	.00	.00		1492.
10	11.06	32.623	10	24.938	302.8	11.06	302.5	.31	.02		1491.
20	10.97	32.621	20	24.953	301.6	10.97	301.1	.61	.06		1491.
30	9.42	32.668	30	25.251	273.3	9.42	272.7	.90	.14		1486.
50	5.87	32.786	50	25.845	216.9	5.86	216.3	1.39	.33		1472.
75	5.27	33.004	75	26.088	194.0	5.26	193.1	1.90	.66		1471.
100	4.84	33.160	99	26.259	177.9	4.84	176.9	2.37	1.07		1470.
125	4.55	33.291	124	26.394	165.2	4.54	164.0	2.79	1.56		1469.
150	4.40	33.418	149	26.511	154.3	4.39	152.9	3.19	2.12		1469.
175	4.27	33.526	174	26.610	145.1	4.26	143.5	3.57	2.74		1469.
200	4.16	33.620	199	26.696	137.2	4.15	135.4	3.92	3.42		1469.
225	4.07	33.703	223	26.772	130.2	4.05	128.2	4.25	4.14		1469.
250	3.98	33.777	248	26.839	124.0	3.96	121.8	4.57	4.91		1469.
300	3.84	33.902	298	26.953	113.6	3.82	111.0	5.16	6.56		1470.
400	3.75	34.028	397	27.061	104.1	3.72	100.6	6.25	10.43		1471.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+ SALINITY, 0/00
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△ TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
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X100
X1000
5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5
* - 77 - 6 - 49

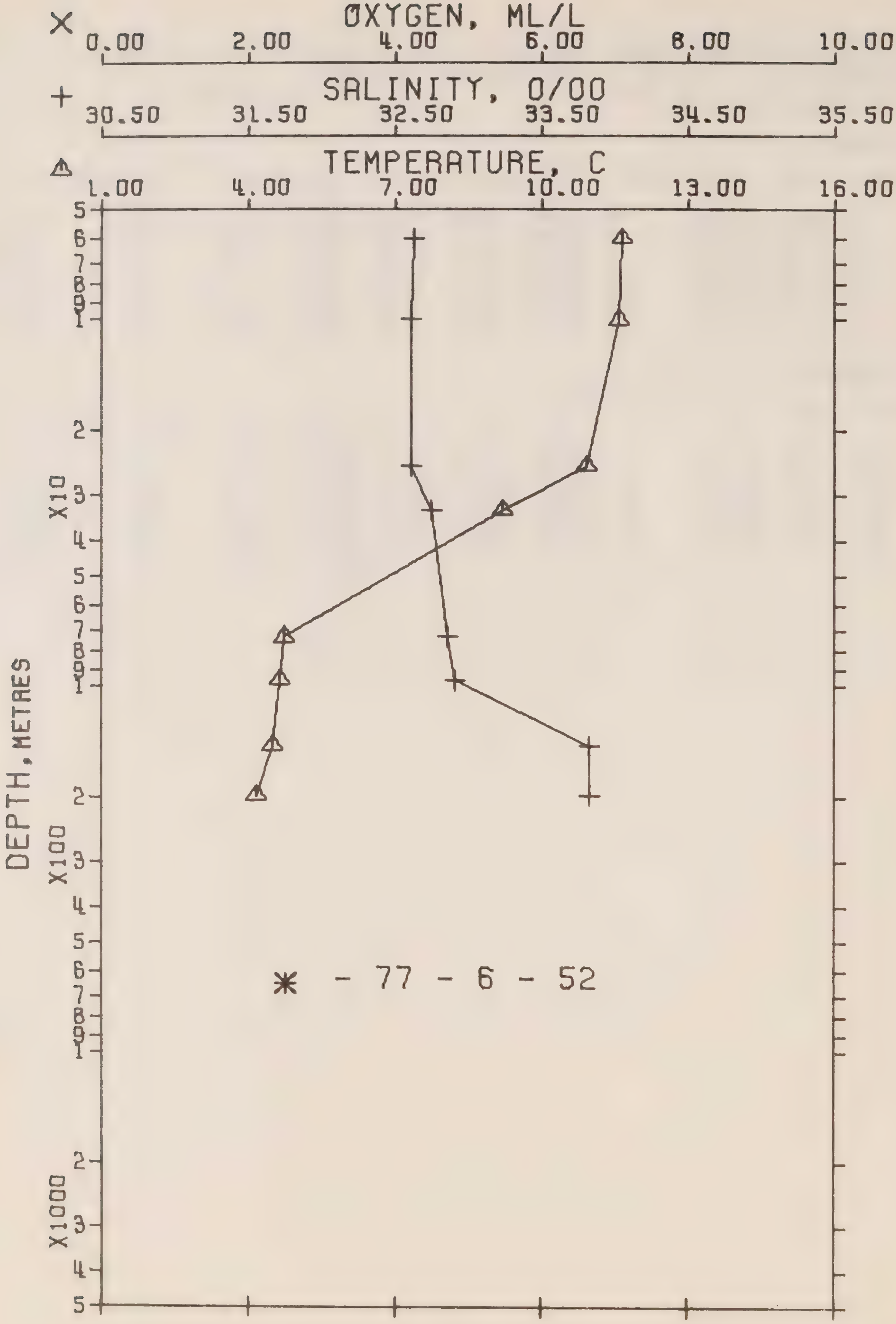
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 49 DATE 14/ 8/77 GMT 18.3
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.55	32.640	0	24.864	309.6	11.55	309.6	.00	.00		1493.
2	11.55	32.621	2	24.849	311.1	11.55	311.0	.06	.00		1493.
5	11.46	32.630	5	24.873	308.9	11.46	308.8	.16	.00		1493.
13	11.48	32.626	13	24.866	309.7	11.48	309.4	.40	.03		1493.
25	10.87	32.627	25	24.976	299.5	10.87	298.9	.77	.10		1491.
50	5.84	32.785	50	25.848	216.6	5.84	216.0	1.41	.34		1472.
75	5.10	32.831	75	25.971	205.1	5.09	204.3	1.92	.67		1470.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.55	32.640	0	24.864	309.6	11.55	309.6	.00	.00		1493.
10	11.47	32.627	10	24.868	309.5	11.47	309.2	.31	.02		1493.
20	11.09	32.627	20	24.937	303.1	11.08	302.6	.62	.06		1492.
30	9.60	32.667	30	25.222	276.1	9.59	275.5	.91	.14		1486.
50	5.84	32.785	50	25.848	216.6	5.84	216.0	1.41	.34		1472.
75	5.10	32.831	75	25.971	205.1	5.09	204.3	1.92	.67		1470.



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SALINITY, 0/00
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TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 52

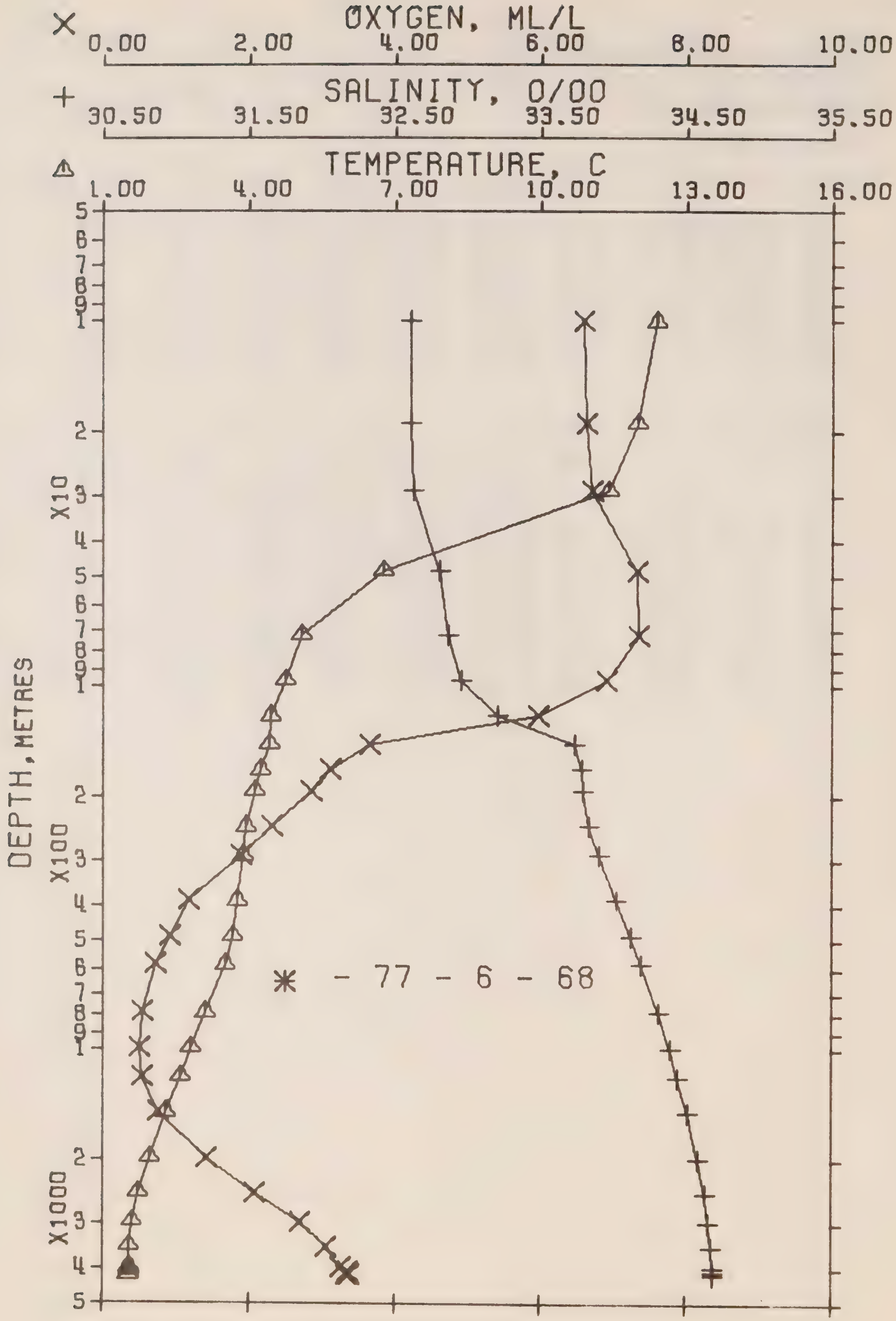
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 52 DATE 15/ 8/77 GMT 18.5
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.62	32.619	0	24.835	312.4	11.62	312.4	.00	.00		1493.
6	11.64	32.629	6	24.839	312.1	11.64	312.0	.19	.01		1493.
10	11.59	32.610	10	24.833	312.7	11.59	312.5	.31	.02		1493.
25	10.94	32.609	25	24.949	302.0	10.94	301.4	.78	.10		1491.
33	9.18	32.747	33	25.351	263.9	9.18	263.2	1.01	.17		1485.
73	4.73	32.864	73	26.037	198.7	4.72	198.0	1.92	.65		1468.
97	4.64	32.912	96	26.085	194.3	4.63	193.4	2.38	1.06		1468.
146	4.48	33.829	145	26.828	124.3	4.47	122.9	3.16	2.00		1470.
200	4.15	33.834	199	26.867	121.0	4.14	119.1	3.83	3.18		1469.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.62	32.619	0	24.835	312.4	11.62	312.4	.00	.00		1493.
10	11.59	32.610	10	24.833	312.7	11.59	312.5	.31	.02		1493.
20	11.11	32.609	20	24.920	304.7	11.10	304.2	.62	.06		1492.
30	9.82	32.697	30	25.208	277.4	9.82	276.8	.92	.14		1487.
50	6.89	32.807	50	25.731	227.8	6.89	227.1	1.42	.34		1477.
75	4.72	32.868	75	26.041	198.3	4.72	197.6	1.95	.68		1468.
100	4.63	32.989	99	26.147	188.5	4.62	187.5	2.45	1.12		1468.
125	4.54	33.484	124	26.549	150.6	4.53	149.4	2.87	1.61		1469.
150	4.45	33.829	149	26.832	124.1	4.44	122.5	3.21	2.08		1470.
175	4.29	33.832	174	26.851	122.4	4.28	120.7	3.52	2.59		1469.
200	4.15	33.834	199	26.867	121.0	4.14	119.1	3.83	3.18		1469.



ØXYGEN, ML/L
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2.00
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6.00
8.00
10.00
SALINITY, 0/00
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 68

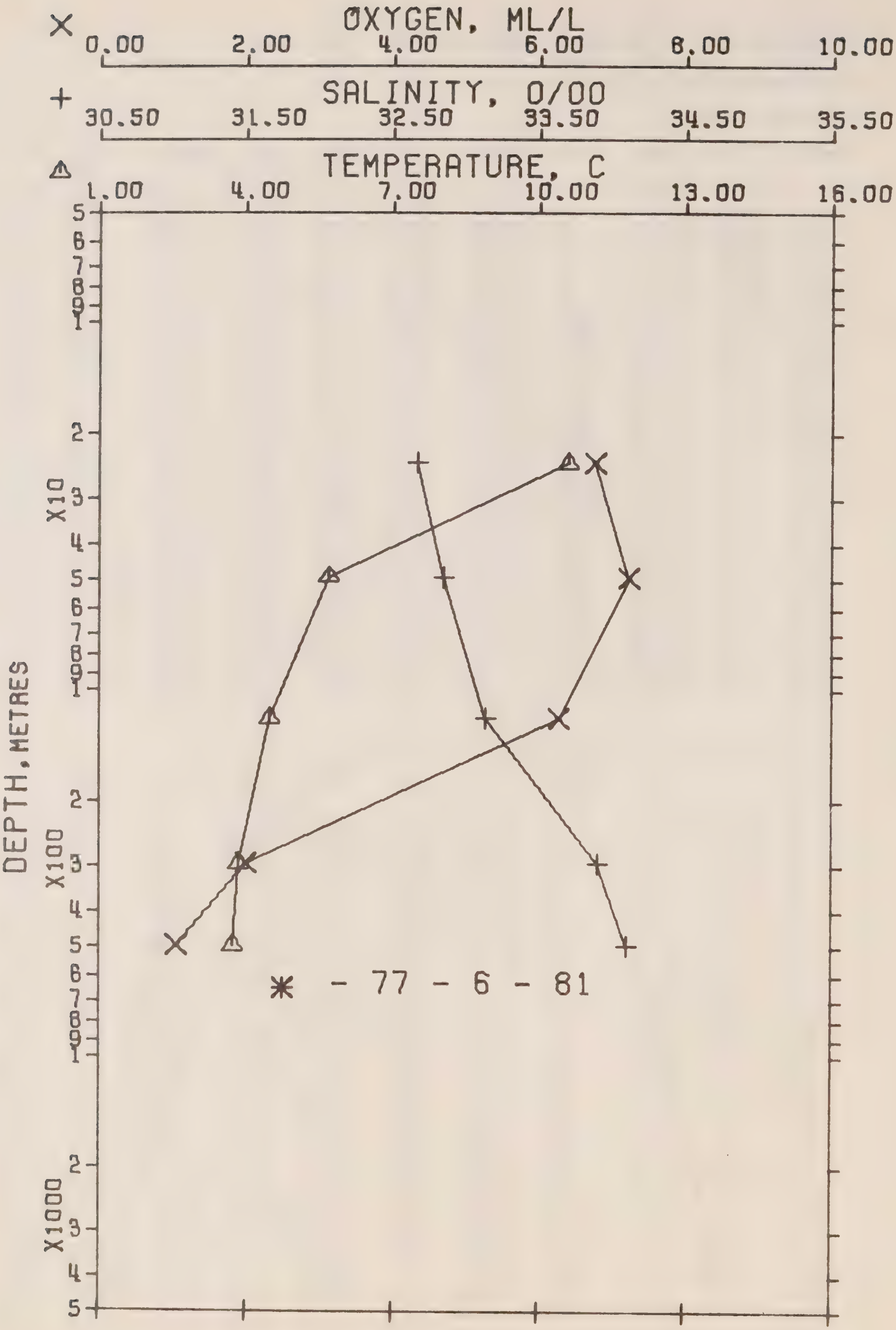
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 68 DATE 20/ 8/77 GMT 19.5
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.50	32.616	0	24.668	328.3	12.50	328.3	.00	.00	6.58	1496.
10	12.40	32.613	10	24.685	326.9	12.40	326.7	.33	.02	6.59	1496.
19	12.02	32.615	19	24.758	320.1	12.02	319.7	.62	.06	6.63	1495.
29	11.41	32.629	29	24.881	308.6	11.41	307.9	.94	.14	6.73	1493.
48	6.76	32.813	48	25.753	225.6	6.76	224.9	1.45	.34	7.34	1476.
72	5.09	32.866	72	25.999	202.3	5.08	201.6	1.96	.65	7.35	1470.
97	4.75	32.963	96	26.114	191.6	4.74	190.7	2.44	1.07	6.93	1469.
121	4.44	33.209	120	26.341	170.2	4.43	169.1	2.88	1.55	5.99	1468.
145	4.42	33.741	144	26.765	130.3	4.41	128.9	3.24	2.04	3.66	1469.
170	4.23	33.788	169	26.822	125.0	4.22	123.4	3.56	2.55	3.12	1469.
194	4.12	33.798	193	26.842	123.4	4.11	121.6	3.87	3.11	2.86	1469.
244	3.93	33.842	242	26.896	118.5	3.91	116.4	4.46	4.45	2.31	1469.
293	3.87	33.915	291	26.960	112.9	3.85	110.3	5.03	6.01	1.89	1470.
391	3.75	34.030	388	27.063	103.8	3.72	100.4	6.09	9.70	1.18	1471.
490	3.68	34.134	486	27.153	96.1	3.65	91.9	7.08	14.13	.93	1472.
587	3.52	34.199	582	27.220	90.3	3.48	85.4	7.98	19.08	.73	1473.
793	3.10	34.324	786	27.359	78.0	3.05	72.2	9.71	31.19	.53	1475.
995	2.80	34.400	985	27.447	70.4	2.73	63.8	11.20	44.75	.50	1477.
1196	2.59	34.449	1184	27.504	65.6	2.51	58.2	12.57	60.05	.55	1480.
1499	2.30	34.517	1483	27.583	58.9	2.20	50.7	14.45	85.86	.76	1484.
2007	1.95	34.595	1982	27.673	51.2	1.81	41.9	17.25	135.75	1.42	1491.
2516	1.73	34.642	2482	27.728	46.9	1.55	36.5	19.73	192.98	2.09	1498.
3026	1.61	34.664	2982	27.754	45.3	1.39	33.7	22.07	259.02	2.70	1506.
3537	1.53	34.677	3481	27.771	44.6	1.26	31.8	24.36	335.60	3.06	1515.
4045	1.54	34.688	3977	27.779	45.3	1.21	30.7	26.64	423.67	3.25	1524.
4147	1.53	34.689	4076	27.780	45.3	1.19	30.5	27.10	442.90	3.35	1525.
4238	1.52	34.695	4165	27.786	45.0	1.17	29.9	27.51	460.52	3.34	1527.
4248	1.53	34.692	4175	27.783	45.4	1.18	30.2	27.55	462.52	3.37	1527.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.50	32.616	0	24.668	328.3	12.50	328.3	.00	.00	6.58	1496.
10	12.40	32.613	10	24.685	326.9	12.40	326.7	.33	.02	6.59	1496.
20	11.95	32.617	20	24.771	318.9	11.95	318.4	.65	.07	6.64	1495.
30	11.15	32.639	30	24.936	303.4	11.14	302.7	.97	.15	6.76	1492.
50	6.62	32.818	50	25.776	223.5	6.61	222.8	1.49	.36	7.34	1475.
75	5.05	32.878	75	26.013	201.0	5.04	200.3	2.02	.69	7.30	1470.
100	4.70	33.001	99	26.149	188.3	4.69	187.4	2.51	1.13	6.78	1469.
125	4.44	33.309	124	26.421	162.7	4.43	161.5	2.95	1.64	5.55	1468.
150	4.38	33.751	149	26.777	129.2	4.37	127.7	3.31	2.14	3.54	1469.
175	4.21	33.790	174	26.826	124.7	4.19	123.0	3.63	2.66	3.06	1469.
200	4.10	33.804	199	26.848	122.7	4.08	120.9	3.93	3.25	2.79	1469.
225	4.00	33.826	223	26.877	120.2	3.98	118.2	4.24	3.91	2.51	1469.
250	3.92	33.852	248	26.905	117.8	3.90	115.5	4.54	4.63	2.26	1469.
300	3.86	33.924	298	26.968	112.1	3.84	109.5	5.11	6.24	1.84	1470.
400	3.74	34.040	397	27.072	103.0	3.72	99.6	6.19	10.07	1.16	1471.
500	3.66	34.141	496	27.160	95.4	3.63	91.2	7.18	14.61	.91	1472.
600	3.49	34.208	595	27.230	89.4	3.45	84.5	8.10	19.79	.71	1473.
700	3.27	34.272	694	27.302	83.1	3.23	77.7	8.96	25.49	.61	1474.
800	3.09	34.327	793	27.362	77.7	3.03	71.8	9.76	31.62	.53	1475.
900	2.93	34.366	892	27.408	73.7	2.87	67.5	10.52	38.18	.51	1476.
1000	2.79	34.401	991	27.448	70.3	2.73	63.6	11.24	45.13	.50	1477.
1200	2.59	34.450	1188	27.505	65.5	2.51	58.1	12.60	60.35	.55	1480.
1500	2.30	34.517	1484	27.583	58.9	2.20	50.6	14.45	85.91	.76	1484.
2000	1.95	34.594	1976	27.672	51.3	1.82	42.0	17.21	135.06	1.41	1491.
2500	1.74	34.641	2466	27.726	47.0	1.56	36.6	19.66	191.09	2.07	1498.
3000	1.62	34.663	2956	27.753	45.3	1.39	33.8	21.95	255.39	2.67	1506.
3500	1.54	34.676	3444	27.770	44.6	1.26	31.9	24.19	329.74	3.03	1514.
4000	1.54	34.687	3933	27.778	45.2	1.21	30.8	26.43	415.31	3.24	1523.
4100	1.53	34.689	4031	27.780	45.3	1.20	30.6	26.88	434.01	3.31	1525.
4200	1.52	34.693	4128	27.783	45.1	1.18	30.1	27.34	453.16	3.34	1526.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6.00
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10.00
SALINITY, O/OO
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31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 6 - 81

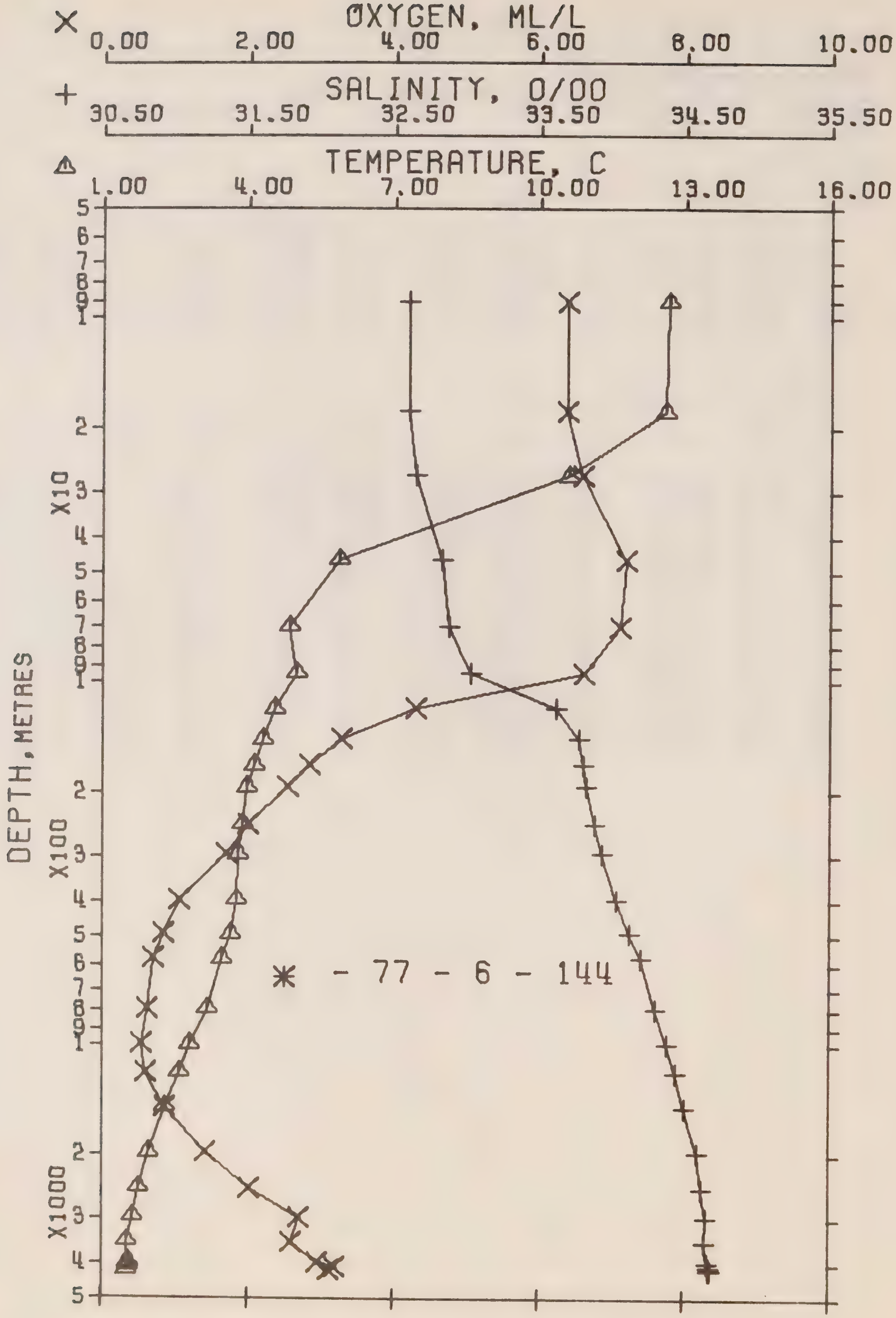
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 81 DATE 24/ 8/77 GMT 18.5
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.32	32.606	0	24.694	325.8	12.32	325.8	.00	.00	6.42	1496.
24	10.60	32.675	24	25.060	291.5	10.60	290.9	.73	.09	6.78	1490.
49	5.68	32.852	49	25.920	209.7	5.68	209.1	1.35	.32	7.24	1472.
120	4.49	33.138	119	26.280	176.0	4.48	174.9	2.69	1.46	6.28	1468.
299	3.86	33.907	297	26.955	113.4	3.84	110.8	5.20	6.65	2.00	1470.
500	3.72	34.112	496	27.131	98.2	3.68	93.9	7.31	15.20	1.06	1473.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.32	32.606	0	24.694	325.8	12.32	325.8	.00	.00	6.42	1496.
10	11.04	32.657	10	24.969	299.8	11.04	299.6	.31	.02	6.69	1491.
20	10.70	32.671	20	25.040	293.2	10.69	292.8	.61	.06	6.76	1490.
30	9.11	32.729	30	25.347	264.2	9.11	263.6	.89	.13	6.92	1485.
50	5.66	32.857	50	25.926	209.2	5.66	208.6	1.36	.32	7.22	1472.
75	5.12	32.987	75	26.091	193.6	5.11	192.8	1.87	.64	6.79	1470.
100	4.73	33.080	99	26.208	182.7	4.73	181.8	2.34	1.06	6.48	1469.
125	4.46	33.174	124	26.311	173.1	4.45	171.9	2.78	1.57	6.08	1468.
150	4.34	33.327	149	26.446	160.5	4.32	159.2	3.20	2.16	5.23	1468.
175	4.23	33.456	174	26.559	149.9	4.22	148.4	3.59	2.80	4.51	1469.
200	4.14	33.568	199	26.658	140.8	4.12	139.0	3.95	3.49	3.89	1469.
225	4.06	33.667	223	26.744	132.8	4.04	130.8	4.29	4.23	3.33	1469.
250	3.98	33.756	248	26.822	125.6	3.97	123.4	4.62	5.02	2.84	1469.
300	3.86	33.908	298	26.955	113.3	3.84	110.7	5.21	6.67	1.99	1470.
400	3.78	34.023	397	27.054	104.7	3.75	101.3	6.30	10.55	1.47	1471.
500	3.72	34.112	496	27.131	98.2	3.68	93.9	7.31	15.20	1.06	1473.



× ØXYGEN, ML/L
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+ SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
△ TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
✱ - 77 - 6 - 144

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-144 DATE 2/ 9/77 GMT 17.8
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.68	32.599	0	24.620	332.8	12.68	332.8	.00	.00	6.37	1497.
9	12.67	32.598	9	24.621	332.9	12.67	332.7	.30	.01	6.38	1497.
18	12.62	32.599	18	24.632	332.2	12.62	331.7	.61	.06	6.38	1497.
27	10.61	32.647	27	25.036	293.8	10.61	293.2	.89	.12	6.61	1490.
46	5.87	32.835	46	25.884	213.2	5.87	212.6	1.37	.30	7.20	1472.
70	4.84	32.879	70	26.037	198.7	4.83	198.0	1.86	.59	7.12	1469.
95	4.98	33.033	94	26.144	188.8	4.97	187.9	2.34	.99	6.62	1470.
119	4.53	33.619	118	26.656	140.4	4.52	139.2	2.74	1.42	4.30	1469.
144	4.29	33.780	143	26.810	126.0	4.28	124.6	3.07	1.87	3.28	1469.
170	4.12	33.809	169	26.850	122.3	4.11	120.8	3.40	2.39	2.84	1469.
195	3.98	33.833	194	26.884	119.3	3.97	117.6	3.70	2.96	2.55	1468.
247	3.87	33.888	245	26.938	114.5	3.85	112.3	4.30	4.31	2.00	1469.
298	3.79	33.942	296	26.989	110.1	3.77	107.5	4.88	5.91	1.70	1469.
399	3.75	34.045	396	27.075	102.7	3.72	99.3	5.95	9.73	1.06	1471.
495	3.64	34.135	491	27.157	95.6	3.61	91.4	6.90	14.07	.85	1472.
581	3.47	34.212	576	27.235	88.7	3.43	84.0	7.70	18.41	.70	1473.
798	3.15	34.312	791	27.345	79.4	3.10	73.5	9.52	31.19	.61	1475.
999	2.81	34.388	989	27.436	71.4	2.74	64.8	11.03	44.97	.55	1477.
1198	2.58	34.448	1186	27.504	65.6	2.50	58.2	12.39	60.23	.60	1480.
1498	2.29	34.513	1482	27.580	59.1	2.19	50.9	14.25	85.87	.87	1484.
1999	1.95	34.598	1975	27.676	51.0	1.81	41.6	16.99	134.55	1.41	1491.
2508	1.76	34.634	2474	27.719	47.8	1.58	37.3	19.51	192.41	2.02	1498.
3025	1.62	34.660	2981	27.750	45.7	1.40	34.0	21.93	260.47	2.69	1506.
3537	1.52	34.655*	3481	27.754	46.0	1.25	33.4	24.26	338.53	2.61+	1515.
4045	1.54	34.674	3977	27.767	46.3	1.21	31.8	26.61	429.16	2.96	1524.
4147	1.53	34.681	4076	27.774	45.9	1.19	31.1	27.07	448.71	3.21	1525.
4238	1.51	34.681	4165	27.775	45.8	1.16	30.9	27.49	466.62	3.13*	1527.
4248	1.52	34.666	4175	27.779	45.6	1.17	30.6	27.54	468.65	3.13*	1527.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.68	32.599	0	24.620	332.8	12.68	332.8	.00	.00	6.37	1497.
10	12.66	32.598	10	24.623	332.8	12.66	332.6	.33	.02	6.38	1497.
20	12.13	32.611	20	24.735	322.4	12.12	321.9	.67	.07	6.43	1495.
30	9.73	32.682	30	25.212	277.0	9.72	276.4	.97	.14	6.72	1487.
50	5.68	32.843	50	25.913	210.4	5.68	209.8	1.45	.34	7.18	1472.
75	4.87	32.912	75	26.060	196.6	4.86	195.8	1.95	.66	7.02	1469.
100	4.87	33.176	99	26.269	177.0	4.86	176.0	2.44	1.09	6.05	1470.
125	4.47	33.662	124	26.697	136.5	4.46	135.3	2.82	1.53	4.03	1469.
150	4.25	33.787	149	26.820	125.1	4.24	123.7	3.15	1.98	3.18	1469.
175	4.09	33.814	174	26.857	121.7	4.08	120.1	3.45	2.49	2.76	1469.
200	3.97	33.838	199	26.889	118.8	3.96	117.1	3.75	3.07	2.49	1468.
225	3.91	33.866	223	26.917	116.4	3.90	114.4	4.05	3.71	2.21	1469.
250	3.86	33.892	248	26.942	114.2	3.85	112.0	4.34	4.40	1.97	1469.
300	3.79	33.944	298	26.991	109.9	3.77	107.3	4.90	5.97	1.69	1469.
400	3.75	34.046	397	27.076	102.7	3.72	99.2	5.96	9.77	1.06	1471.
500	3.63	34.140	496	27.162	95.2	3.59	91.0	6.95	14.31	.84	1472.
600	3.44	34.222	595	27.246	87.8	3.40	82.9	7.86	19.42	.69	1473.
700	3.28	34.271	694	27.300	83.2	3.23	77.8	8.72	25.08	.65	1474.
800	3.15	34.313	793	27.346	79.4	3.09	73.4	9.53	31.30	.61	1475.
900	2.97	34.353	892	27.394	75.1	2.91	68.8	10.30	37.98	.58	1476.
1000	2.81	34.388	990	27.437	71.4	2.74	64.7	11.03	45.07	.55	1477.
1200	2.58	34.448	1188	27.505	65.6	2.50	58.2	12.40	60.37	.60	1480.
1500	2.29	34.513	1484	27.581	59.0	2.19	50.9	14.26	86.01	.87	1484.
2000	1.95	34.598	1975	27.676	51.0	1.81	41.6	17.00	134.62	1.41	1491.
2500	1.76	34.634	2466	27.719	47.9	1.58	37.3	19.48	191.48	2.02	1498.
3000	1.63	34.659	2956	27.749	45.8	1.40	34.2	21.81	256.95	2.66	1506.
3500	1.53	34.655	3444	27.753	46.0	1.26	33.5	24.09	332.50	2.61	1514.
4000	1.54	34.672	3933	27.766	46.2	1.21	31.9	26.40	420.61	2.93	1523.
4100	1.53	34.678	4031	27.771	46.1	1.20	31.4	26.86	439.69	3.09	1525.
4200	1.52	34.681	4128	27.775	45.8	1.17	31.0	27.32	459.11	3.16	1526.

Results of STD Observations

(P-77-6)

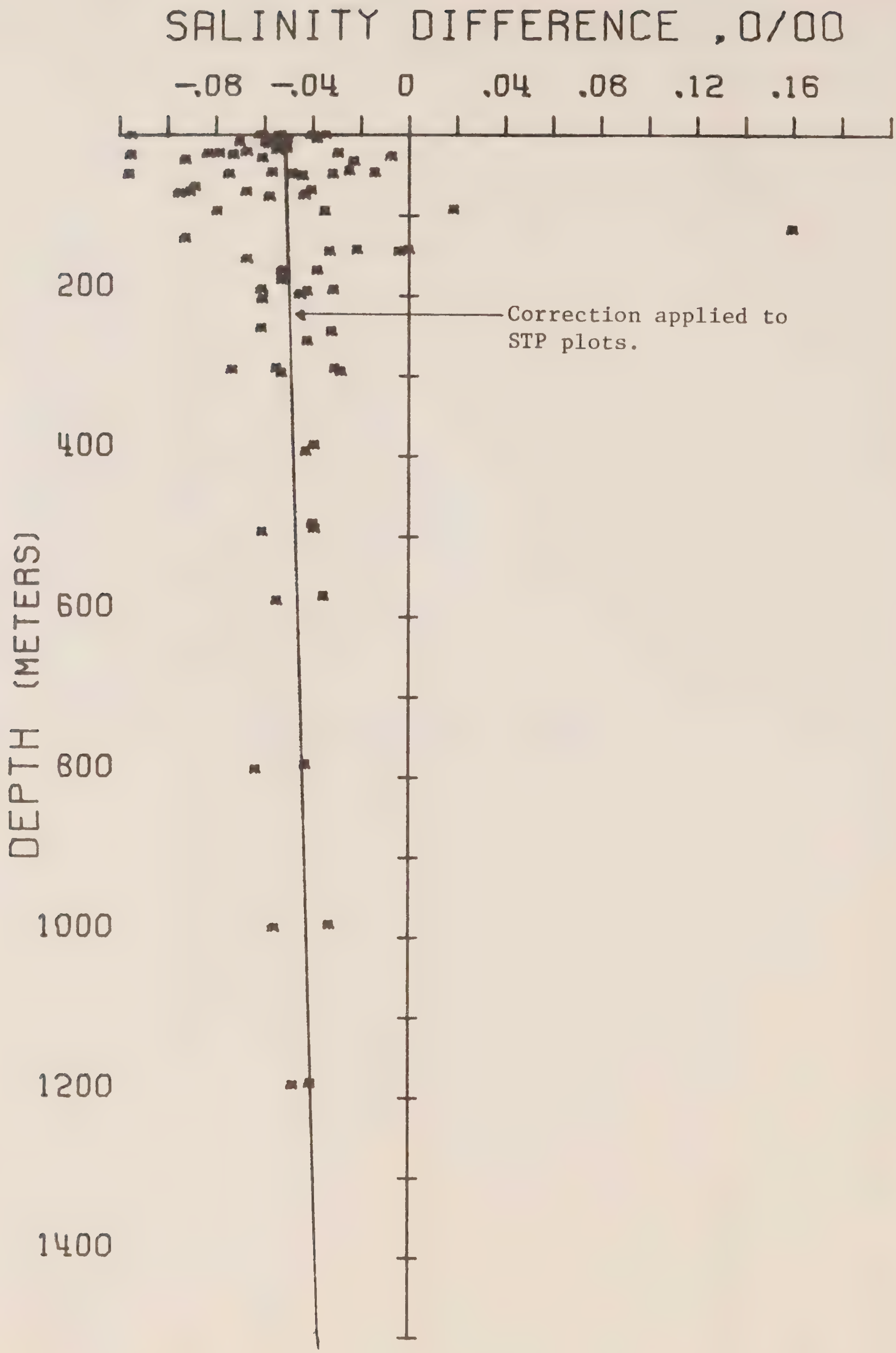


Figure 5. Salinity difference between hydro data and STP. P-77-6.

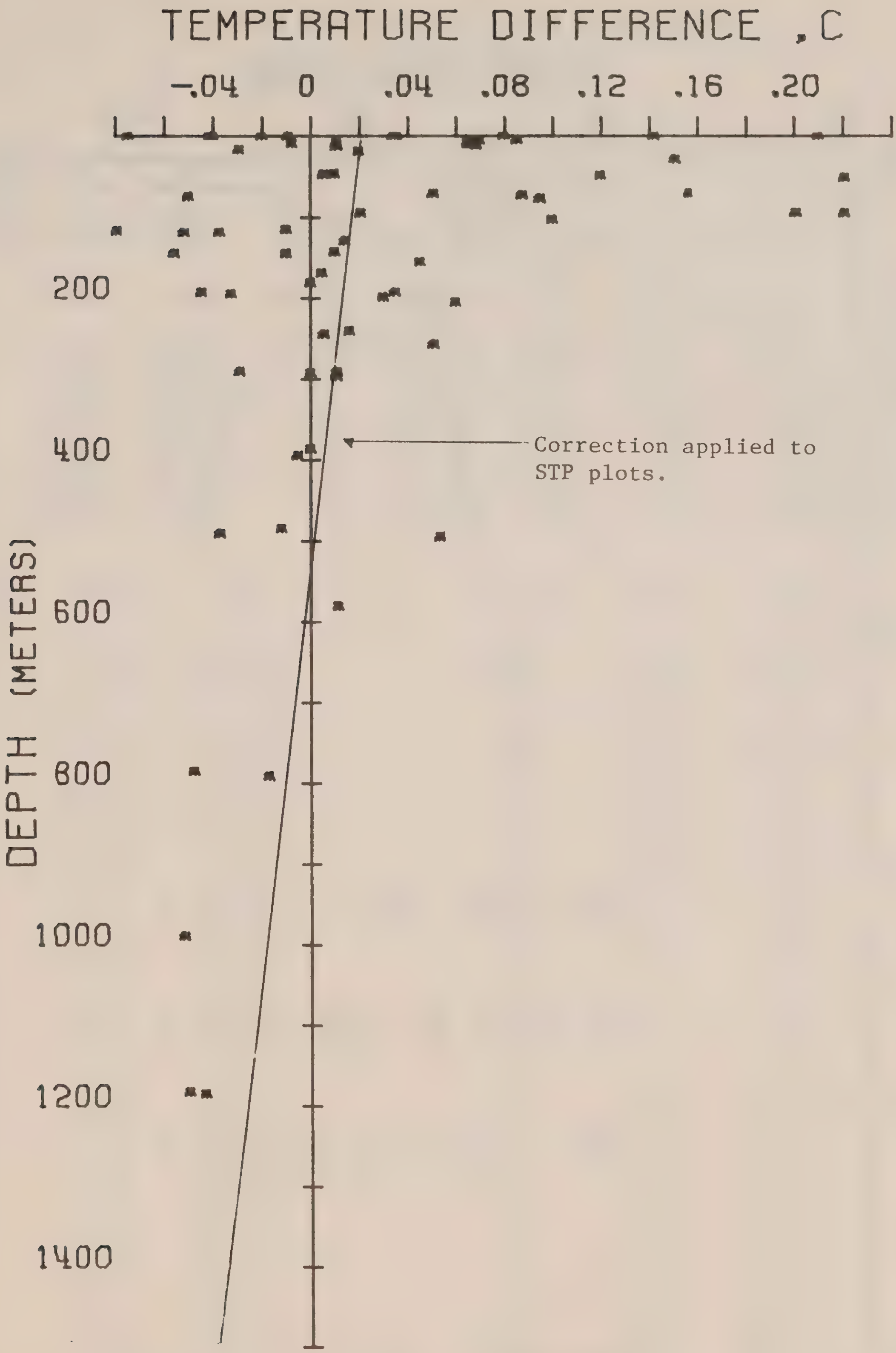
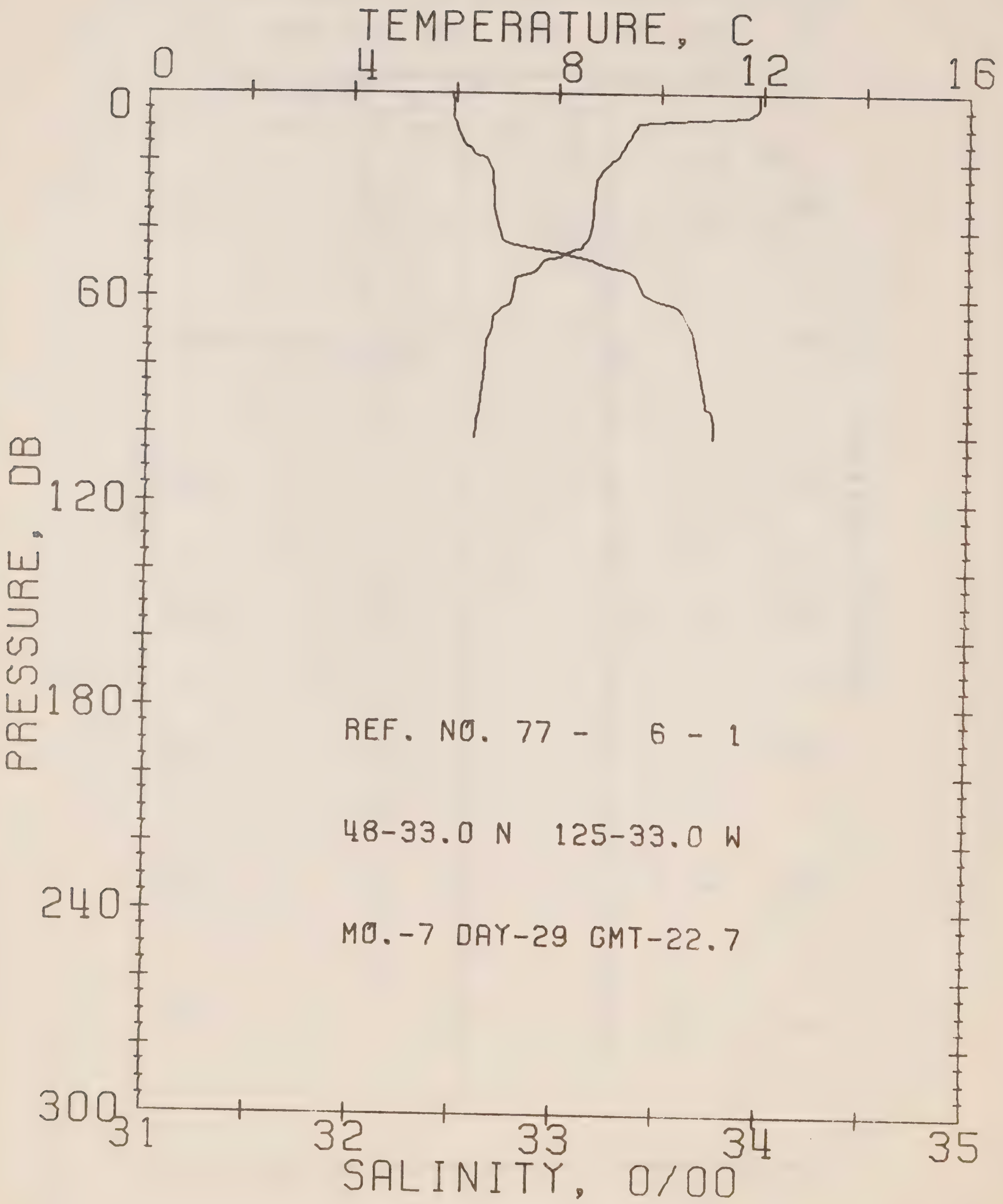


Figure 6. Temperature difference between hydro data and STP. P-77-6.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PRESSURE, DB
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REF. NO. 77 - 6 - 1
48-33.0 N 125-33.0 W
MO.-7 DAY-29 GMT-22.7
31
32
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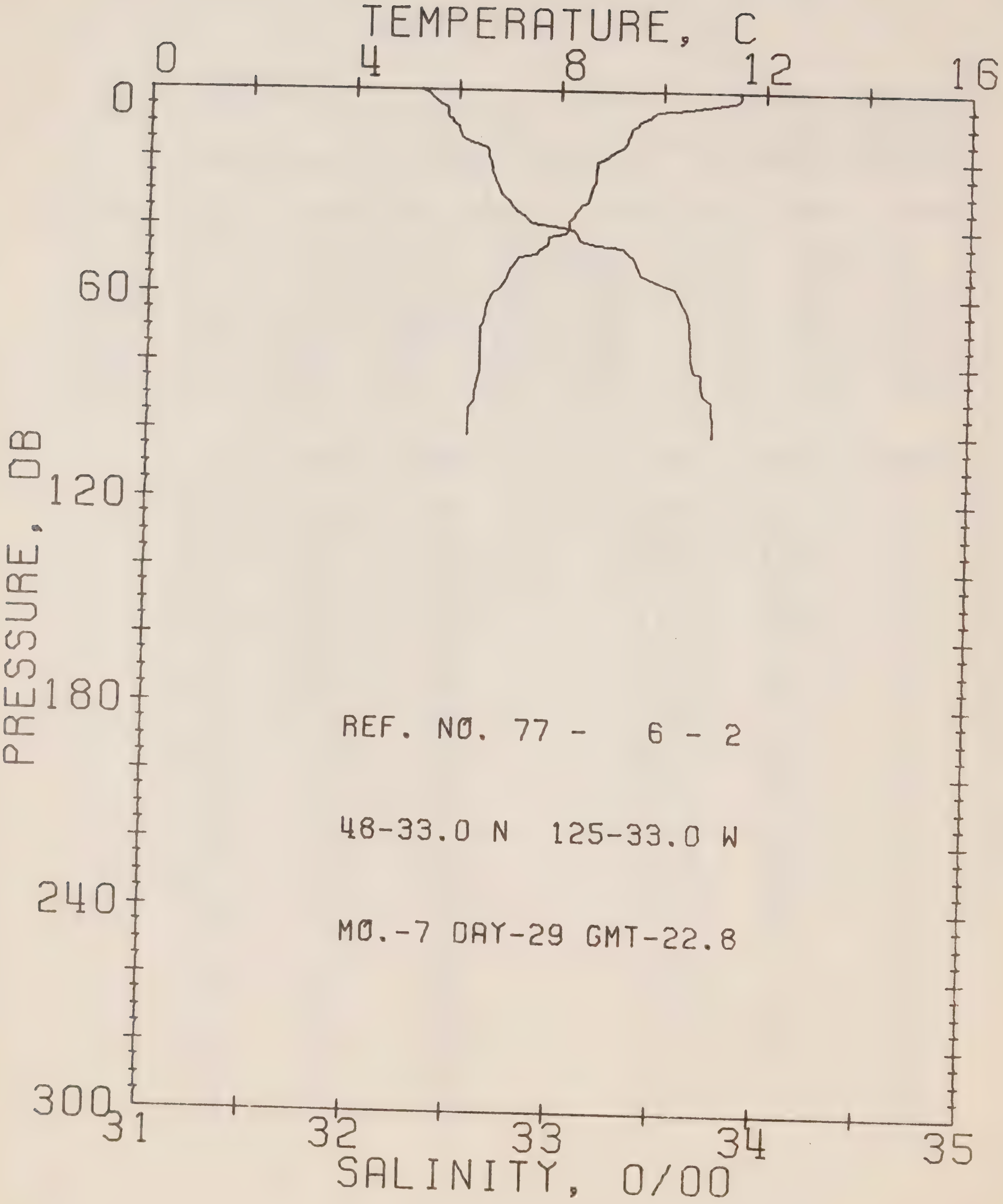
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 1 DATE 29/ 7/77 STATION 1
POSITION 48-33.0N, 125-33.0W GMT 22.7
RESULTS OF STP CAST 56 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.93	32.48	0	24.67	328.0	0.0	0.0	1494.
10	9.51	32.50	10	25.11	287.0	0.32	0.02	1486.
20	9.06	32.65	20	25.30	268.9	0.60	0.06	1484.
30	8.71	32.69	30	25.38	261.3	0.86	0.13	1483.
50	7.68	33.20	50	25.93	209.1	1.36	0.33	1480.
75	6.59	33.68	75	26.46	159.5	1.80	0.61	1477.
100	6.39	33.77	99	26.56	150.4	2.19	0.95	1477.

DEPTH	TEMP	SAL
0.	11.93	32.48
1.	11.93	32.48
3.	11.93	32.49
4.	11.91	32.49
5.	11.86	32.49
7.	11.70	32.49
8.	10.24	32.49
9.	9.54	32.50
10.	9.51	32.50
11.	9.47	32.51
13.	9.41	32.52
15.	9.30	32.54
16.	9.29	32.57
17.	9.22	32.58
18.	9.21	32.59
19.	9.14	32.65
21.	8.98	32.66
23.	8.85	32.68
25.	8.74	32.68
29.	8.72	32.69
33.	8.70	32.69
34.	8.69	32.69
39.	8.66	32.71
43.	8.58	32.73
44.	8.52	32.76
45.	8.47	32.86
46.	8.28	32.95
47.	8.15	33.02

DEPTH	TEMP	SAL
48.	8.04	33.10
49.	7.73	33.16
51.	7.63	33.24
52.	7.56	33.34
53.	7.45	33.36
54.	7.18	33.38
57.	7.15	33.40
59.	7.12	33.42
61.	7.10	33.49
62.	7.05	33.57
63.	6.90	33.59
65.	6.76	33.62
68.	6.72	33.64
70.	6.68	33.66
72.	6.61	33.67
76.	6.59	33.65
79.	6.58	33.69
83.	6.55	33.70
85.	6.54	33.71
89.	6.51	33.72
92.	6.49	33.73
93.	6.48	33.75
95.	6.44	33.76
97.	6.44	33.77
98.	6.42	33.77
99.	6.40	33.77
100.	6.39	33.77
101.	6.39	33.77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180
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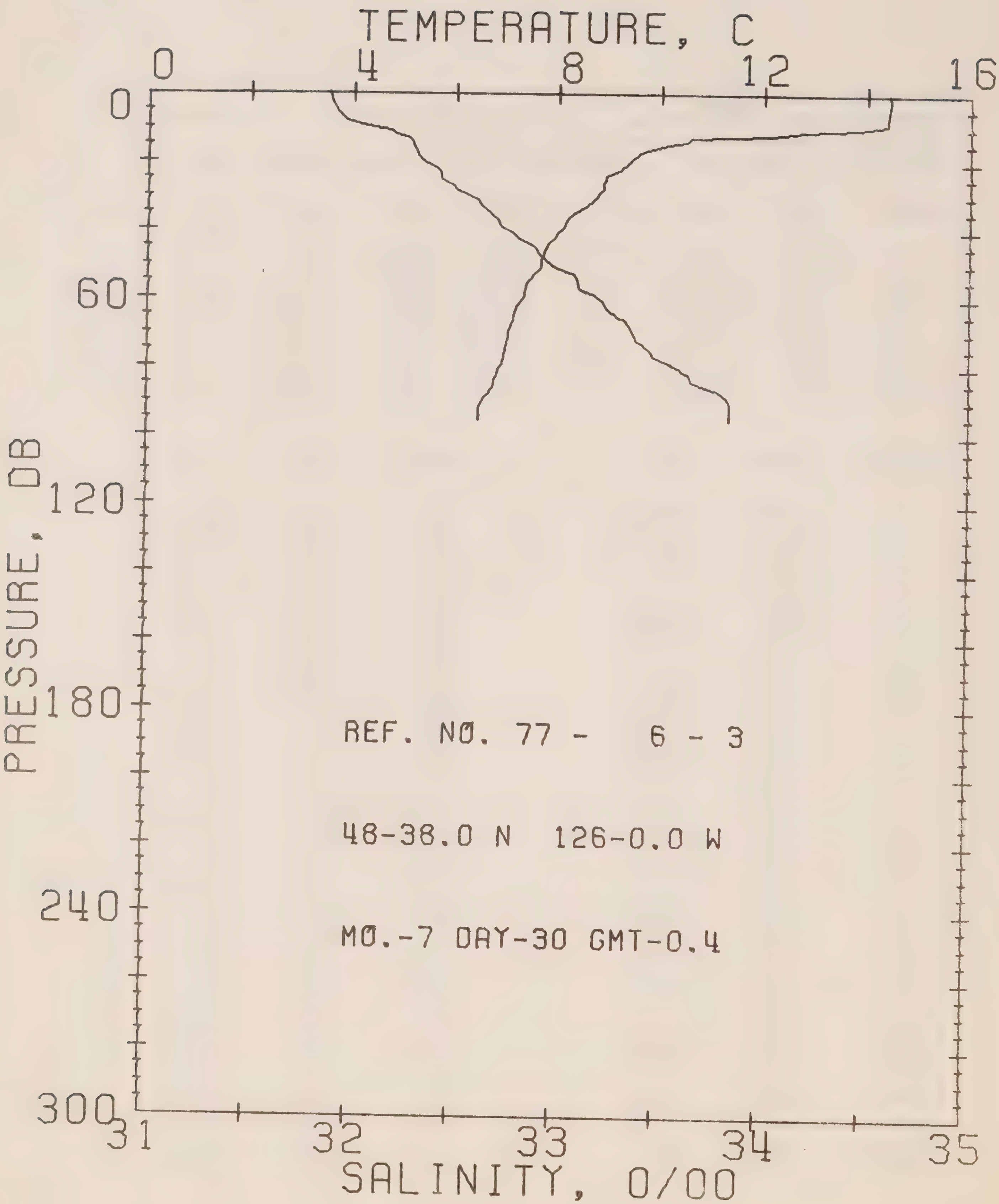
PRESSURE, DB
REF. NØ. 77 - 6 - 2
48-33.0 N 125-33.0 W
MØ.-7 DAY-29 GMT-22.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 2 DATE 29/ 7/77 STATION 1
POSITION 48-33.0N, 125-33.0W GMT 22.8
RESULTS OF STP CAST 60 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DLLTA D	POT. EN	SJUND
0	11.50	32.32	0	24.63	332.3	0.0	0.0	1492.
10	9.50	32.48	10	25.09	288.3	0.31	0.02	1485.
20	8.86	32.65	20	25.33	266.2	0.59	0.06	1483.
30	8.58	32.71	30	25.42	257.8	0.85	0.12	1483.
50	7.14	33.37	50	26.14	189.4	1.31	0.31	1478.
75	6.48	33.65	75	26.45	160.3	1.73	0.58	1476.
100	6.27	33.76	99	26.56	149.7	2.12	0.92	1476.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	11.50	32.32	43.	7.79	33.09
1.	11.53	32.35	44.	7.78	33.10
3.	11.47	32.38	45.	7.76	33.18
4.	11.00	32.41	46.	7.67	33.31
5.	10.47	32.44	47.	7.59	33.32
6.	9.87	32.45	48.	7.55	33.34
8.	9.70	32.45	49.	7.19	33.36
9.	9.55	32.47	53.	7.01	33.39
10.	9.50	32.48	54.	6.98	33.40
11.	9.40	32.50	56.	6.93	33.48
12.	9.37	32.50	58.	6.83	33.57
14.	9.32	32.52	60.	6.67	33.58
15.	9.31	32.54	63.	6.60	33.61
17.	9.20	32.64	64.	6.56	33.62
18.	9.04	32.65	68.	6.53	33.64
20.	8.86	32.65	69.	6.49	33.64
21.	8.72	32.66	77.	6.48	33.65
24.	8.69	32.67	79.	6.48	33.65
26.	8.68	32.68	82.	6.47	33.66
29.	8.61	32.70	83.	6.46	33.70
30.	8.58	32.71	86.	6.39	33.70
32.	8.57	32.74	89.	6.37	33.71
35.	8.35	32.78	91.	6.36	33.75
36.	8.29	32.81	93.	6.28	33.75
37.	8.26	32.83	95.	6.28	33.75
38.	8.18	32.85	96.	6.28	33.76
39.	8.18	32.86	97.	6.28	33.76
40.	8.19	33.01	98.	6.28	33.76
41.	8.16	33.07	99.	6.27	33.76
42.	8.11	33.08	101.	6.27	33.76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48-38.0 N 126-0.0 W
MØ.-7 DAY-30 GMT-0.4
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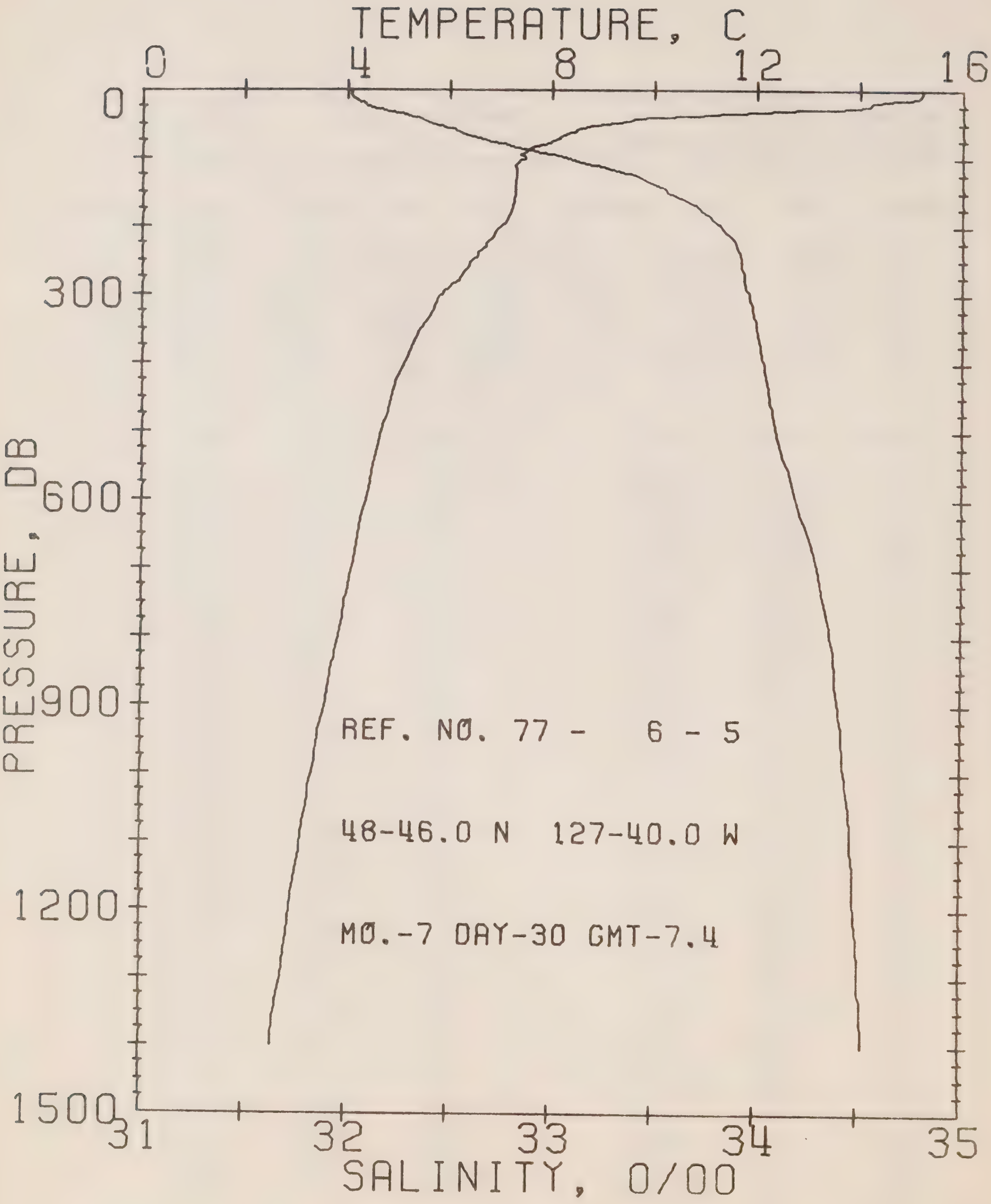
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 3 DATE 30/ 7/77 STATION 2
POSITION 48-38.0N, 126- 0.0W GMT 0.4
RESULTS OF STP CAST 65 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.43	31.88	0	23.71	419.2	0.0	0.0	1502.
10	13.82	32.10	10	24.01	391.5	0.41	0.02	1500.
20	9.38	32.35	20	25.01	296.3	0.74	0.07	1435.
30	8.78	32.56	30	25.27	271.6	1.02	0.14	1483.
50	7.68	32.96	50	25.75	226.6	1.52	0.34	1480.
75	6.99	33.45	75	26.22	181.6	2.02	0.66	1478.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	14.43	31.88	49.	7.69	32.94
2.	14.44	31.89	51.	7.67	32.99
4.	14.43	31.90	53.	7.55	33.08
6.	14.41	31.93	56.	7.39	33.10
8.	14.38	31.96	57.	7.38	33.10
9.	14.36	32.01	58.	7.37	33.14
10.	13.82	32.10	59.	7.36	33.18
11.	12.78	32.18	60.	7.34	33.20
12.	12.10	32.20	61.	7.28	33.22
13.	10.59	32.26	62.	7.22	33.23
14.	10.50	32.28	63.	7.21	33.24
15.	10.12	32.29	65.	7.15	33.29
17.	9.66	32.30	66.	7.14	33.33
19.	9.47	32.32	70.	7.05	33.37
20.	9.38	32.35	72.	7.03	33.38
22.	9.22	32.41	73.	7.01	33.41
23.	9.13	32.42	75.	6.99	33.45
24.	8.93	32.43	77.	6.97	33.47
25.	8.93	32.43	79.	6.93	33.55
27.	8.89	32.49	80.	6.89	33.59
28.	8.89	32.50	81.	6.85	33.60
29.	8.84	32.53	82.	6.82	33.64
31.	8.72	32.60	84.	6.78	33.65
33.	8.57	32.63	86.	6.75	33.74
34.	8.44	32.65	87.	6.68	33.79
35.	8.33	32.67	88.	6.64	33.81
37.	8.18	32.70	89.	6.58	33.83
39.	8.14	32.72	91.	6.50	33.84
41.	8.01	32.78	92.	6.49	33.84
42.	7.96	32.80	93.	6.48	33.84
44.	7.81	32.87	94.	6.47	33.34
45.	7.79	32.89	95.	6.47	33.84
47.	7.73	32.91			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MØ.-7 DAY-30 GMT-7.4
31
32
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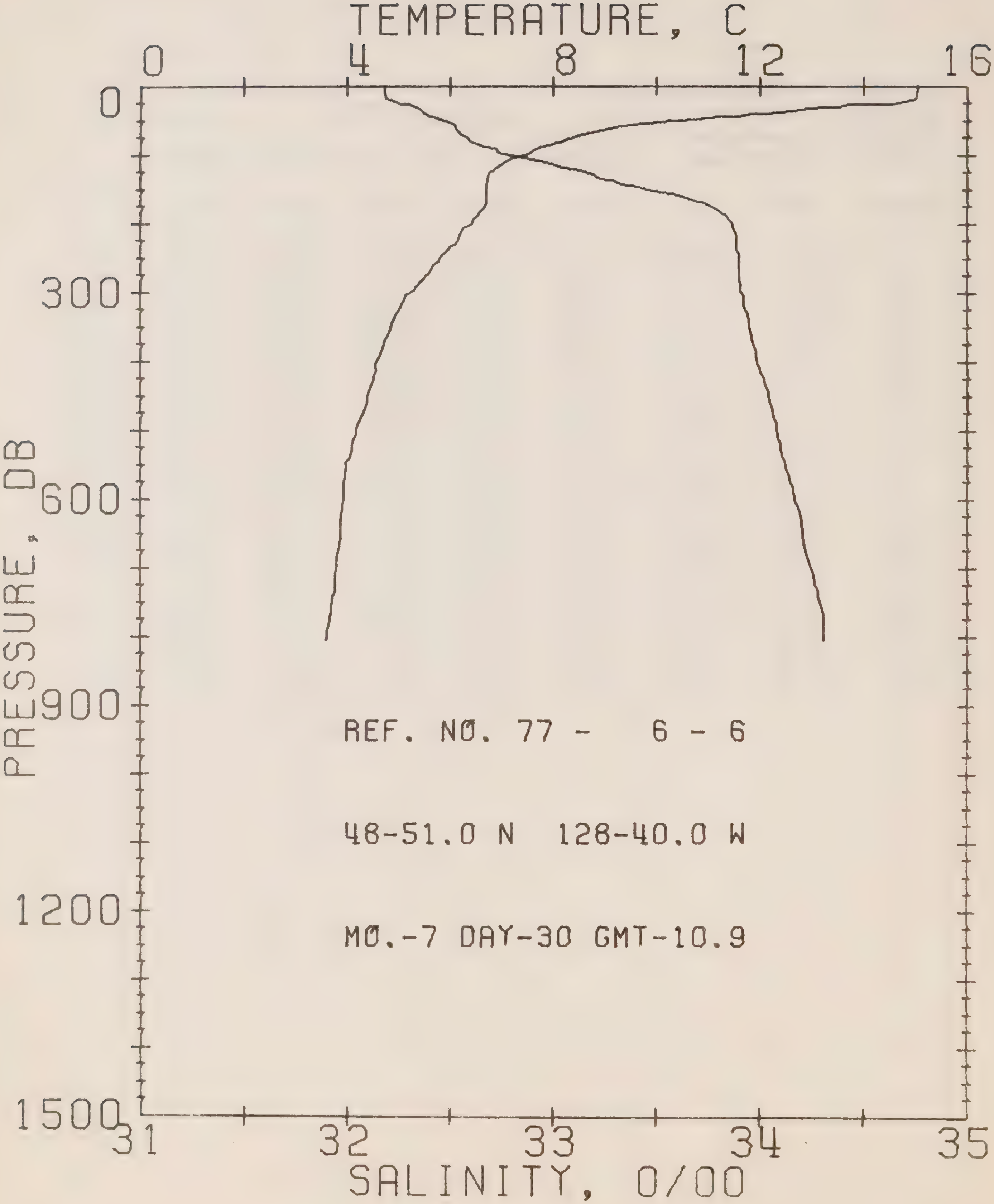
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 5 DATE 30/ 7/77 STATION 4
POSITION 48-46.0N, 127-40.0W GMT 7.4
RESULTS OF STP CAST 216 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.19	32.02	0	23.66	424.3	0.0	0.0	1504.
10	15.17	32.02	10	23.67	424.4	0.42	0.02	1504.
20	14.23	32.08	20	23.91	401.3	0.84	0.08	1502.
30	12.63	32.18	30	24.31	363.6	1.23	0.18	1497.
50	9.01	32.42	50	25.12	286.1	1.86	0.44	1484.
75	8.01	32.70	75	25.49	251.3	2.53	0.86	1481.
100	7.43	33.08	99	25.87	215.4	3.11	1.38	1480.
125	7.30	33.41	124	26.15	189.7	3.62	1.96	1480.
150	7.27	33.56	149	26.27	178.2	4.08	2.60	1481.
175	7.21	33.73	174	26.41	165.4	4.51	3.31	1481.
200	7.00	33.82	199	26.52	155.8	4.91	4.07	1481.
225	6.73	33.90	224	26.61	146.8	5.28	4.89	1480.
250	6.44	33.93	248	26.68	141.1	5.64	5.76	1479.
300	5.83	33.97	298	26.78	131.1	6.33	7.68	1478.
400	5.11	34.04	397	26.92	118.5	7.58	12.12	1477.
500	4.66	34.10	496	27.02	109.7	8.72	17.34	1477.
600	4.37	34.20	595	27.13	99.9	9.76	23.21	1477.
800	3.83	34.36	793	27.32	83.4	11.58	36.09	1478.
1000	3.31	34.43	991	27.43	73.5	13.14	50.38	1480.
1200	2.90	34.49	1188	27.51	66.4	14.53	65.94	1481.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900
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REF. NØ. 77 - 6 - 6
48-51.0 N 128-40.0 W
MØ.-7 DAY-30 GMT-10.9
31
32
33
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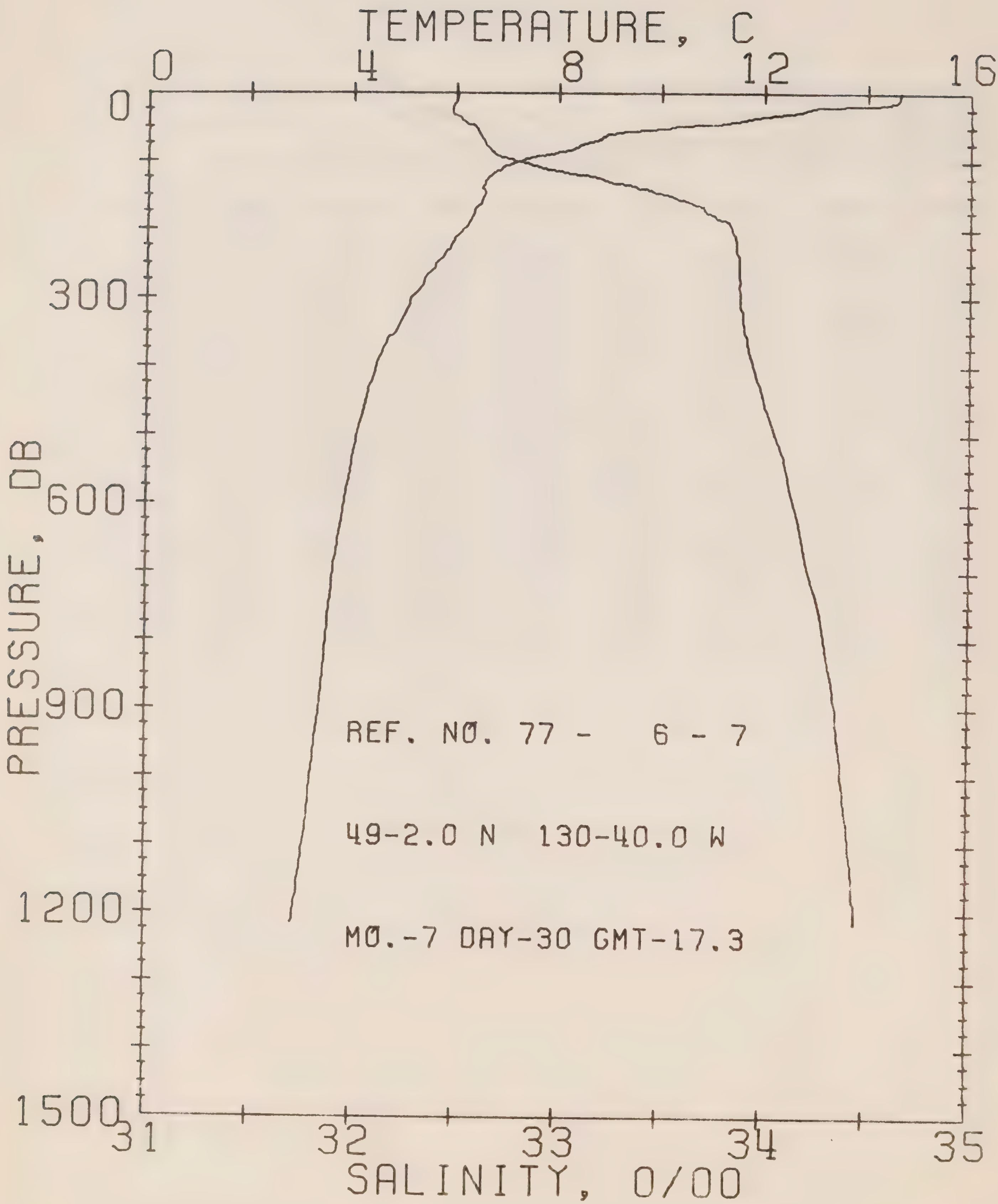
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 6 DATE 30/ 7/77 STATION 5
POSITION 48-51.0N, 128-40.0W GMT 10.9
RESULTS OF STP CAST 188 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.03	32.18	0	23.82	409.3	0.0	0.0	1504.
10	15.02	32.18	10	23.82	409.6	0.41	0.02	1504.
20	14.94	32.21	20	23.86	406.0	0.82	0.08	1504.
30	13.51	32.32	30	24.24	369.9	1.21	0.18	1500.
50	10.53	32.46	50	24.91	306.9	1.88	0.46	1490.
75	8.35	32.58	75	25.35	265.0	2.59	0.90	1482.
100	7.43	32.80	99	25.65	236.2	3.21	1.46	1479.
125	6.78	33.16	124	26.02	201.2	3.76	2.08	1478.
150	6.70	33.46	149	26.27	178.1	4.24	2.75	1478.
175	6.65	33.77	174	26.52	155.1	4.65	3.43	1479.
200	6.40	33.86	199	26.63	144.9	5.02	4.15	1478.
225	6.11	33.89	224	26.69	139.6	5.38	4.91	1478.
250	5.78	33.90	248	26.74	135.1	5.72	5.75	1477.
300	5.21	33.91	298	26.81	128.1	6.38	7.59	1475.
400	4.57	33.99	397	26.95	116.0	7.60	11.92	1474.
500	4.17	34.08	496	27.06	105.5	8.70	16.97	1474.
600	3.91	34.17	595	27.16	96.9	9.71	22.62	1475.
800	3.59	34.31	793	27.30	84.5	11.51	35.46	1477.


TEMPERATURE, C
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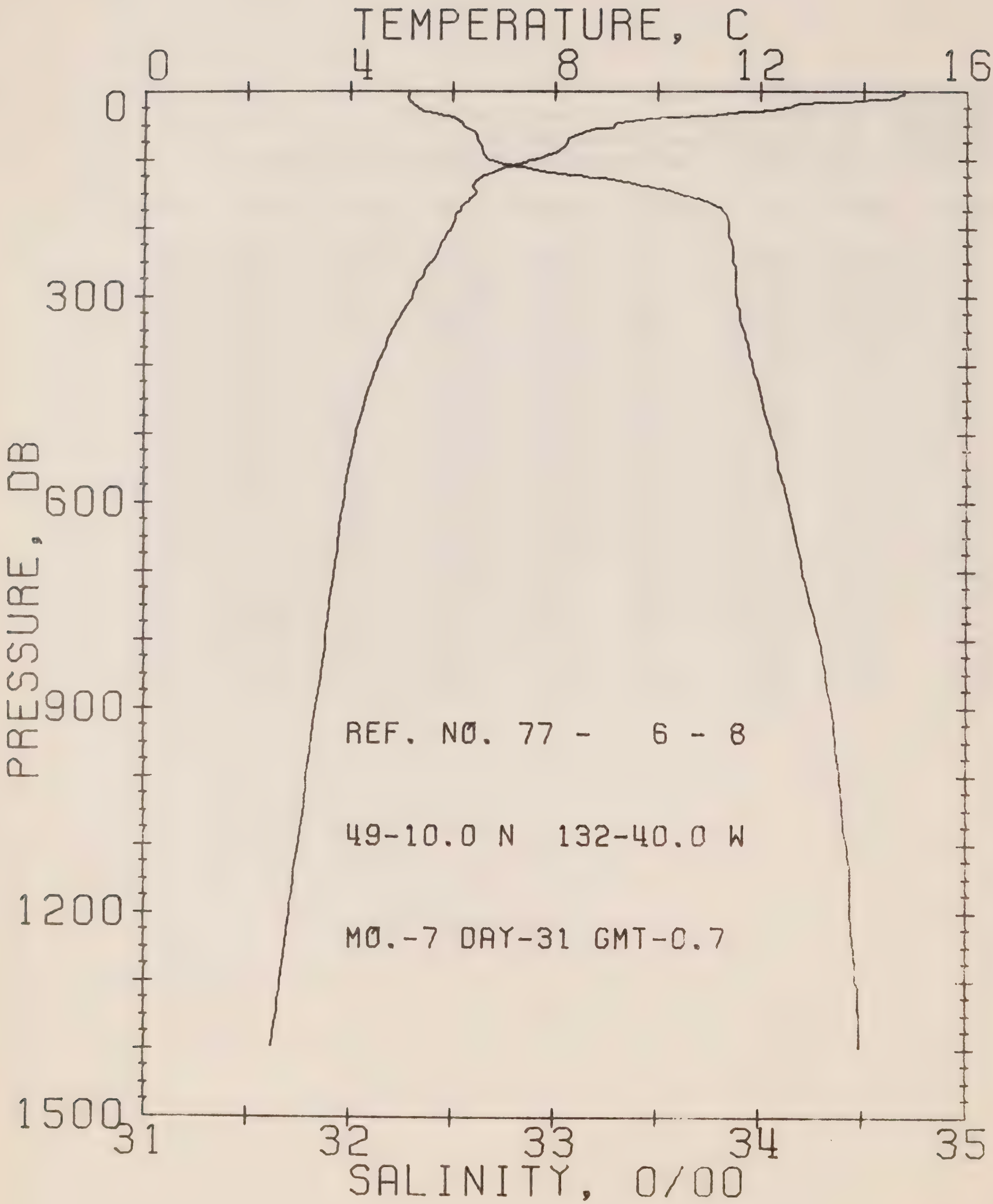
PRESSURE, DB
REF. NØ. 77 - 6 - 7
49-2.0 N 130-40.0 W
MØ.-7 DAY-30 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 7 DATE 30/ 7/77 STATION 6
POSITION 49- 2.0N, 130-40.0W GMT 17.3
RESULTS OF STP CAST 198 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.63	32.51	0	24.16	377.0	0.0	0.0	1503.
10	14.60	32.50	10	24.16	377.3	0.38	0.02	1503.
20	13.35	32.49	20	24.41	354.1	0.75	0.08	1499.
30	12.44	32.48	30	24.57	338.1	1.09	0.16	1496.
50	10.25	32.59	50	25.05	292.7	1.73	0.42	1489.
75	8.51	32.64	75	25.37	262.8	2.42	0.86	1483.
100	7.29	32.78	99	25.66	235.8	3.04	1.41	1479.
125	6.60	33.20	124	26.08	195.6	3.58	2.03	1477.
150	6.35	33.53	149	26.35	170.6	4.04	2.67	1478.
175	6.34	33.72	174	26.52	154.5	4.44	3.34	1478.
200	6.13	33.84	199	26.65	143.1	4.81	4.04	1477.
225	5.89	33.87	224	26.70	138.4	5.16	4.80	1477.
250	5.61	33.88	248	26.74	134.5	5.51	5.63	1476.
300	5.13	33.89	298	26.81	128.7	6.16	7.48	1475.
400	4.45	33.95	397	26.93	117.3	7.40	11.87	1474.
500	4.07	34.06	496	27.05	106.3	8.52	16.98	1474.
600	3.84	34.15	595	27.15	97.9	9.53	22.67	1475.
800	3.49	34.30	793	27.31	83.8	11.34	35.53	1477.
1000	3.21	34.39	991	27.40	75.8	12.93	50.09	1479.
1200	2.89	34.46	1188	27.49	68.2	14.37	66.21	1481.


TEMPERATURE, C
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1200
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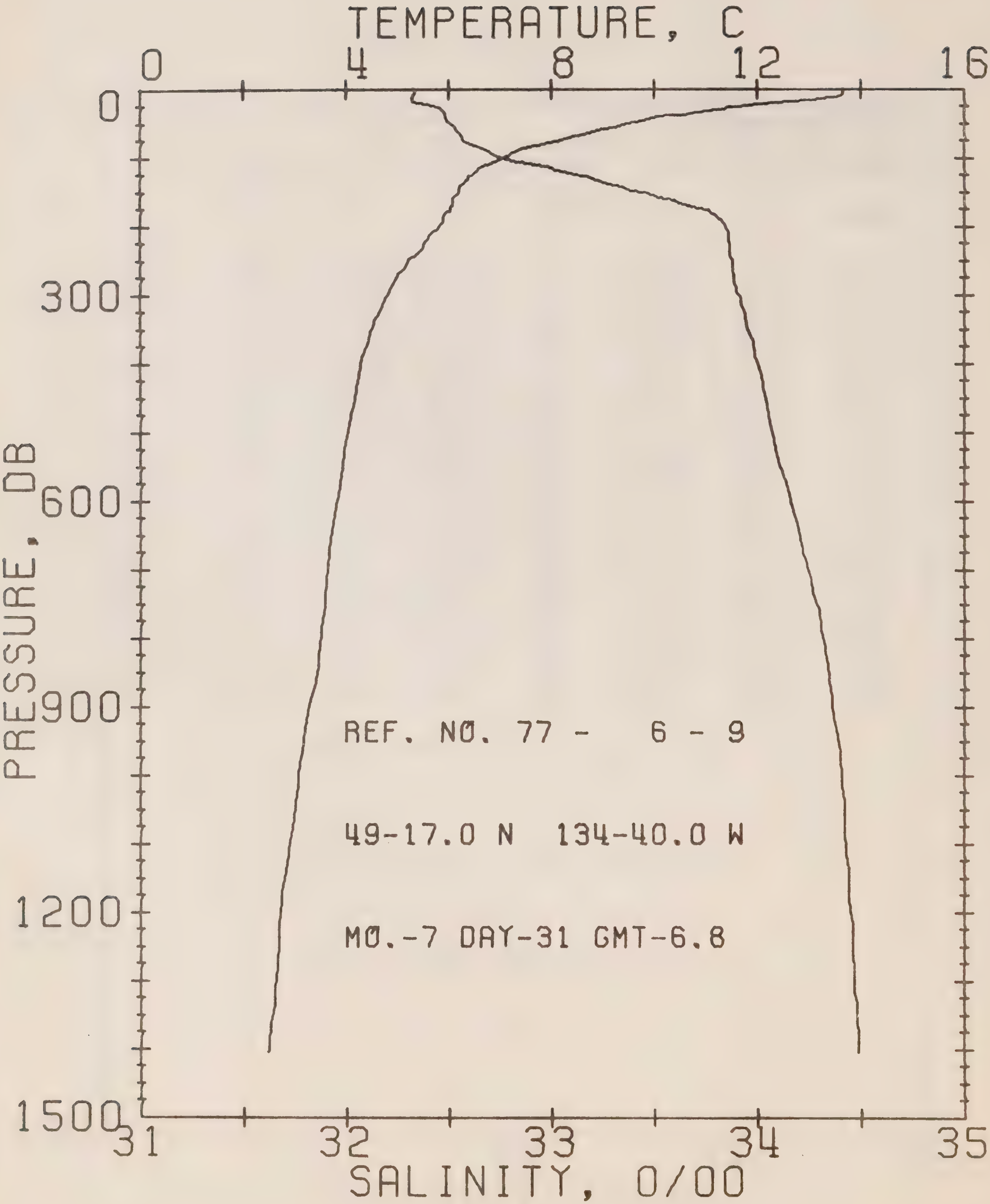
PRESSURE, DB
REF. NØ. 77 - 6 - 8
49-10.0 N 132-40.0 W
MØ.-7 DAY-31 GMT-0.7
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 8 DATE 31/ 7/77 STATION 7
POSITION 49-10.0N, 132-40.0W GMT 0.7
RESULTS OF STP CAST 209 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.77	32.29	0	23.96	395.9	0.0	0.0	1503.
10	14.63	32.28	10	23.98	394.3	0.40	0.02	1503.
20	12.65	32.31	20	24.40	354.2	0.77	0.08	1497.
30	11.96	32.36	30	24.57	338.3	1.12	0.17	1494.
50	9.11	32.55	50	25.21	277.9	1.72	0.41	1485.
75	8.21	32.63	75	25.41	259.4	2.39	0.83	1482.
100	7.56	32.68	99	25.54	246.9	3.02	1.40	1480.
125	6.55	33.17	124	26.06	197.5	3.59	2.04	1477.
150	6.43	33.60	149	26.42	164.0	4.03	2.66	1477.
175	6.12	33.82	174	26.63	144.3	4.41	3.29	1477.
200	5.95	33.85	199	26.68	140.3	4.76	3.97	1477.
225	5.75	33.86	223	26.71	137.2	5.11	4.72	1476.
250	5.57	33.87	248	26.74	134.8	5.45	5.54	1476.
300	5.19	33.88	298	26.79	130.1	6.11	7.39	1475.
400	4.51	33.96	397	26.93	117.2	7.34	11.78	1474.
500	4.09	34.05	496	27.05	106.8	8.46	16.90	1474.
600	3.87	34.13	595	27.14	99.0	9.49	22.66	1475.
800	3.52	34.29	793	27.29	85.1	11.33	35.77	1477.
1000	3.16	34.39	991	27.41	75.2	12.93	50.38	1479.
1200	2.82	34.44	1188	27.48	68.9	14.36	66.44	1481.


TEMPERATURE, C
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300
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1200
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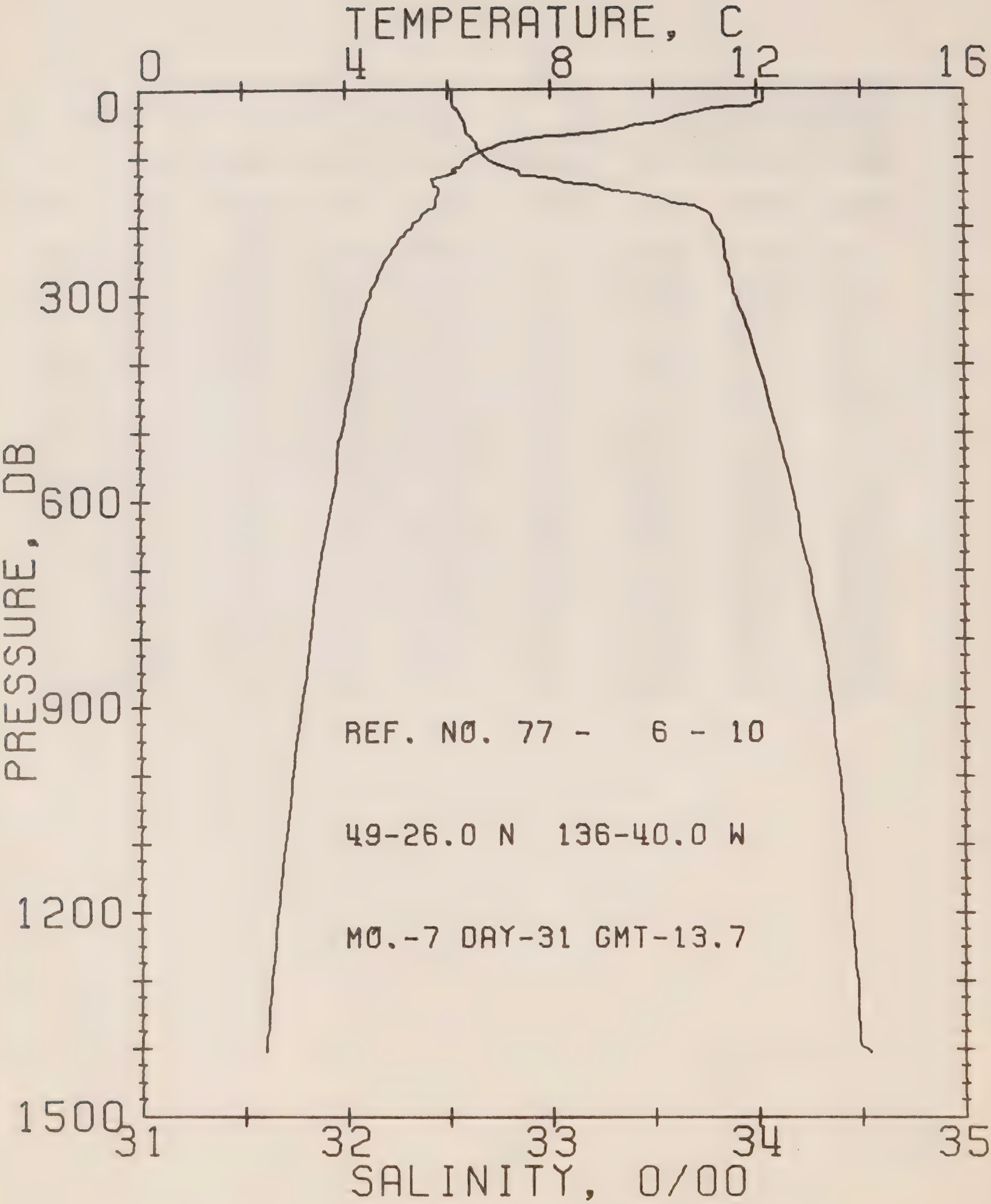
PRESSURE, DB
REF. NØ. 77 - 6 - 9
49-17.0 N 134-40.0 W
MØ.-7 DAY-31 GMT-6.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 9 DATE 31/ 7/77 STATION 8
POSITION 49-17.0N, 134-40.0W GMT 6.8
RESULTS OF STP CAST 223 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.66	32.33	0	24.22	371.1	0.0	0.0	1500.
10	13.61	32.33	10	24.23	370.5	0.37	0.02	1500.
20	12.50	32.34	20	24.46	349.2	0.73	0.07	1496.
30	11.37	32.46	30	24.76	320.6	1.06	0.16	1493.
50	9.53	32.51	50	25.11	287.6	1.67	0.40	1486.
75	8.14	32.57	75	25.37	262.4	2.35	0.84	1482.
100	7.05	32.76	99	25.67	234.1	2.97	1.39	1478.
125	6.43	33.15	124	26.06	197.5	3.51	2.01	1476.
150	6.19	33.45	149	26.33	172.4	3.98	2.66	1476.
175	6.02	33.73	174	26.57	149.8	4.38	3.33	1476.
200	5.80	33.85	199	26.69	138.8	4.74	4.01	1476.
225	5.51	33.86	223	26.74	134.3	5.08	4.75	1475.
250	5.19	33.88	248	26.79	129.5	5.41	5.55	1474.
300	4.78	33.91	298	26.86	123.2	6.05	7.33	1474.
400	4.28	34.00	397	26.99	111.9	7.22	11.49	1473.
500	4.01	34.07	496	27.07	104.5	8.30	16.44	1474.
600	3.81	34.16	595	27.16	96.5	9.30	22.07	1475.
800	3.48	34.32	793	27.32	82.6	11.08	34.72	1477.
1000	3.05	34.41	990	27.43	72.5	12.63	48.90	1478.
1200	2.70	34.45	1188	27.50	66.8	14.03	64.54	1480.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PRESSURE, DB
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300
600
900
1200
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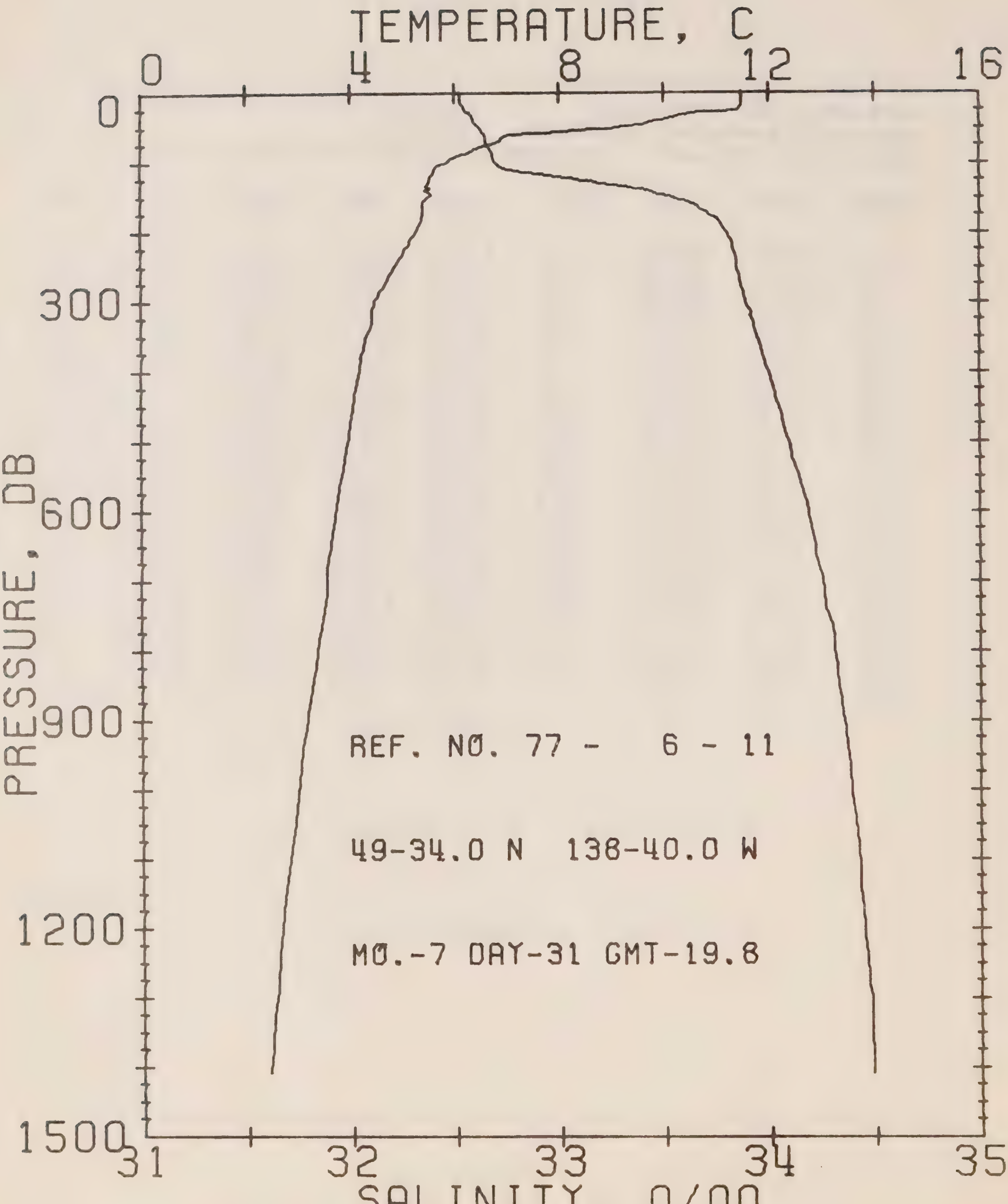
SALINITY, 0/00
REF. NØ. 77 - 6 - 10
49-26.0 N 136-40.0 W
MØ.-7 DAY-31 GMT-13.7

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 10 DATE 31/ 7/77 STATION 9
POSITION 49-26.0N, 136-40.0W GMT 13.7
RESULTS OF STP CAST 194 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.13	32.52	0	24.66	328.7	0.0	0.0	1495.
10	12.12	32.52	10	24.67	328.9	0.33	0.02	1495.
20	12.10	32.52	20	24.67	328.8	0.66	0.07	1495.
30	11.10	32.54	30	24.87	310.1	0.98	0.15	1492.
50	10.00	32.58	50	25.09	289.4	1.58	0.39	1488.
75	7.27	32.63	75	25.54	246.4	2.25	0.82	1478.
100	6.41	32.69	99	25.70	231.5	2.85	1.35	1475.
125	5.99	32.86	124	25.89	213.7	3.41	1.99	1474.
150	5.81	33.34	149	26.29	176.2	3.89	2.66	1475.
175	5.64	33.73	174	26.62	145.2	4.29	3.32	1475.
200	5.30	33.80	199	26.71	136.3	4.64	3.99	1474.
225	4.99	33.84	223	26.78	130.0	4.97	4.70	1473.
250	4.77	33.85	248	26.82	127.0	5.29	5.48	1473.
300	4.47	33.89	298	26.88	121.2	5.91	7.21	1472.
400	4.14	34.01	397	27.01	109.8	7.06	11.30	1473.
500	3.90	34.10	496	27.11	101.1	8.11	16.14	1473.
600	3.70	34.18	595	27.19	93.7	9.08	21.59	1474.
800	3.28	34.31	793	27.34	80.8	10.82	33.96	1476.
1000	2.93	34.40	990	27.43	72.1	12.35	47.92	1478.
1200	2.63	34.45	1188	27.50	66.1	13.73	63.42	1480.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300
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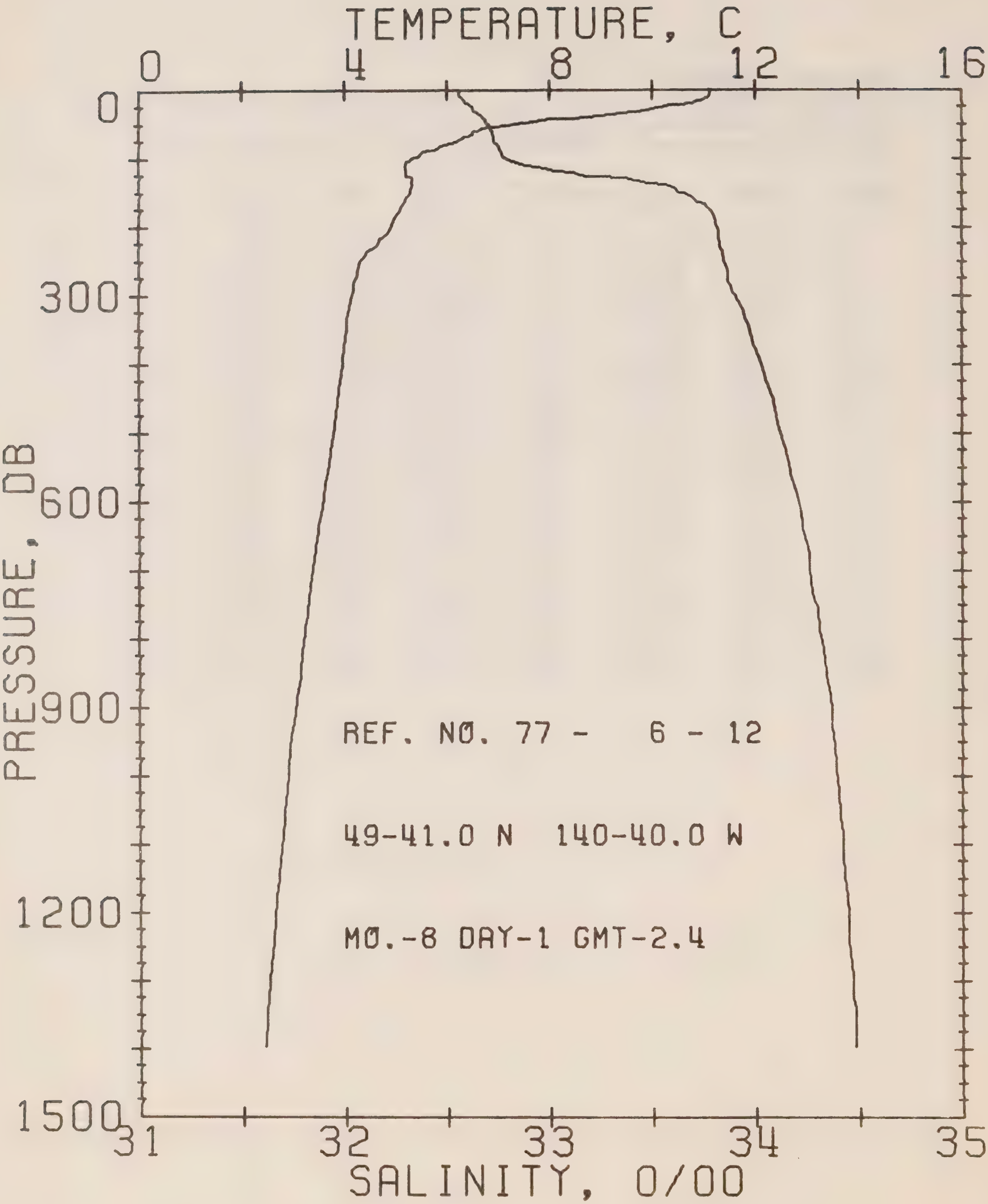
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 11
49-34.0 N 138-40.0 W
MØ.-7 DAY-31 GMT-19.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 11 DATE 31/ 7/77 STATION 10
POSITION 49-34.0N, 138-40.0W GMT 19.8
RESULTS OF STP CAST 200 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.49	32.52	0	24.78	317.4	0.0	0.0	1493.
10	11.49	32.53	10	24.79	317.1	0.32	0.02	1493.
20	11.47	32.54	20	24.80	316.4	0.63	0.06	1493.
30	10.58	32.57	30	24.98	299.2	0.95	0.14	1490.
50	9.14	32.61	50	25.25	273.6	1.52	0.38	1485.
75	6.66	32.65	75	25.64	236.8	2.14	0.77	1476.
100	5.82	32.69	99	25.78	223.9	2.72	1.28	1473.
125	5.50	33.09	124	26.13	190.9	3.24	1.88	1473.
150	5.47	33.53	149	26.48	157.5	3.67	2.49	1473.
175	5.37	33.71	174	26.64	143.2	4.04	3.10	1474.
200	5.24	33.79	199	26.72	136.1	4.39	3.77	1474.
225	5.04	33.83	223	26.77	131.3	4.73	4.49	1473.
250	4.83	33.85	248	26.81	127.7	5.05	5.27	1473.
300	4.46	33.89	298	26.88	121.1	5.67	7.01	1472.
400	4.14	33.99	397	27.00	110.7	6.83	11.13	1473.
500	3.92	34.09	496	27.09	102.2	7.89	16.00	1473.
600	3.69	34.19	595	27.20	93.2	8.87	21.47	1474.
800	3.34	34.31	793	27.33	81.7	10.62	33.90	1476.
1000	2.96	34.39	990	27.43	73.1	12.16	48.02	1478.
1200	2.63	34.45	1188	27.50	66.2	13.55	63.56	1480.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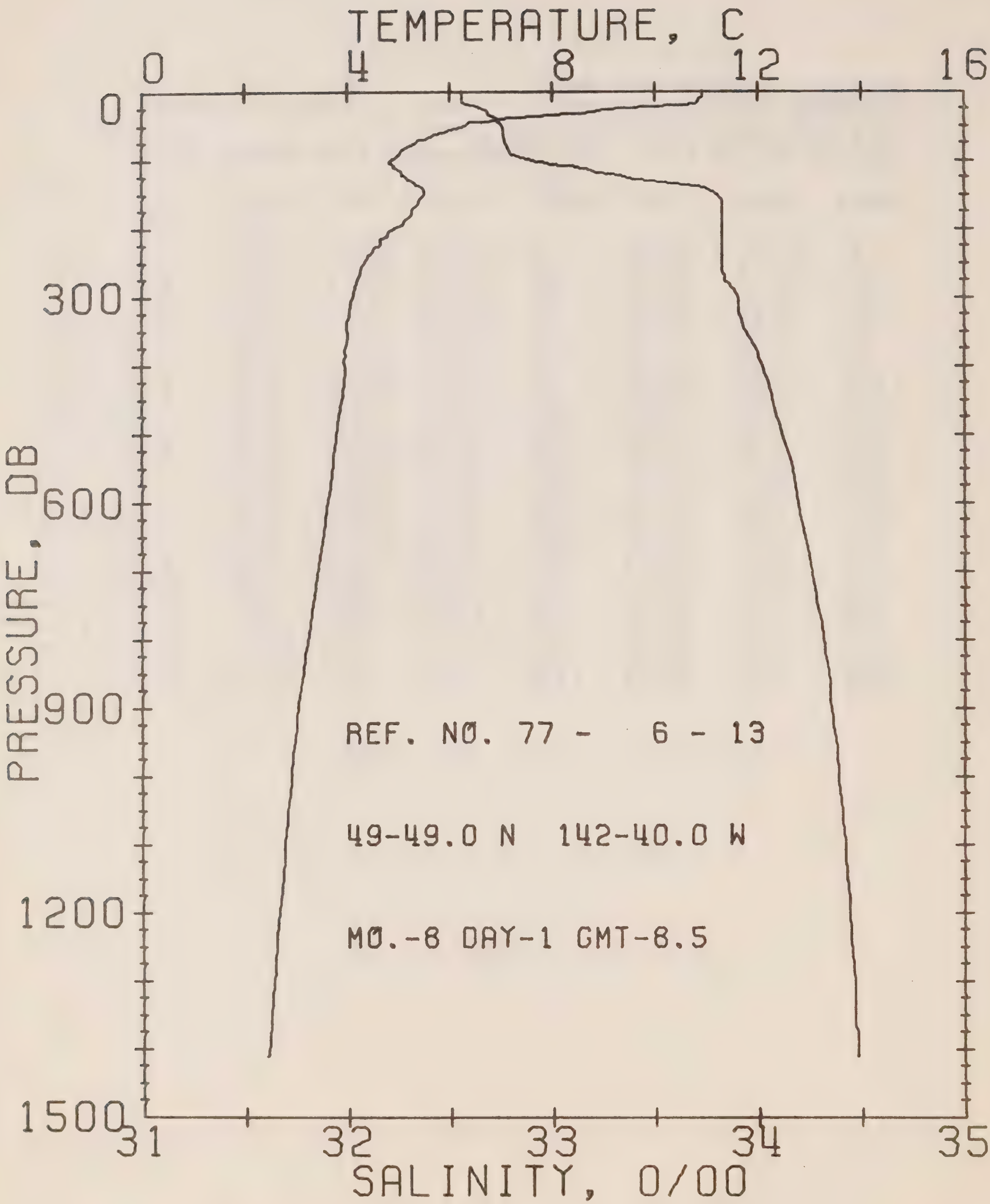
PRESSURE, DB
REF. NØ. 77 - 6 - 12
49-41.0 N 140-40.0 W
MØ.-8 DAY-1 GMT-2.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 12 DATE 1/ 8/77 STATION 11
POSITION 49-41.0N, 140-40.0W GMT 2.4
RESULTS OF STP CAST 201 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.11	32.55	0	24.87	308.7	0.0	0.0	1491.
10	11.10	32.56	10	24.88	308.2	0.31	0.02	1491.
20	10.76	32.60	20	24.97	300.0	0.61	0.06	1490.
30	9.88	32.63	30	25.15	283.5	0.90	0.14	1487.
50	7.31	32.70	50	25.59	241.4	1.43	0.35	1478.
75	6.19	32.73	75	25.76	225.3	2.01	0.72	1474.
100	5.36	32.78	99	25.90	211.9	2.55	1.20	1471.
125	5.21	33.19	124	26.24	180.1	3.05	1.77	1471.
150	5.27	33.63	149	26.58	148.0	3.44	2.32	1473.
175	5.06	33.78	174	26.73	134.8	3.79	2.90	1472.
200	4.89	33.81	199	26.77	130.5	4.13	3.53	1472.
225	4.61	33.83	223	26.82	126.5	4.45	4.23	1472.
250	4.29	33.85	248	26.87	121.8	4.76	4.98	1471.
300	4.13	33.90	298	26.92	116.8	5.35	6.66	1471.
400	3.93	34.03	397	27.04	106.2	6.46	10.61	1472.
500	3.76	34.12	496	27.14	98.0	7.48	15.27	1473.
600	3.55	34.21	595	27.22	90.2	8.42	20.54	1474.
800	3.19	34.32	793	27.35	79.6	10.12	32.58	1476.
1000	2.88	34.39	990	27.44	71.9	11.62	46.36	1478.
1200	2.62	34.45	1188	27.50	66.1	13.00	61.84	1480.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PRESSURE, DB
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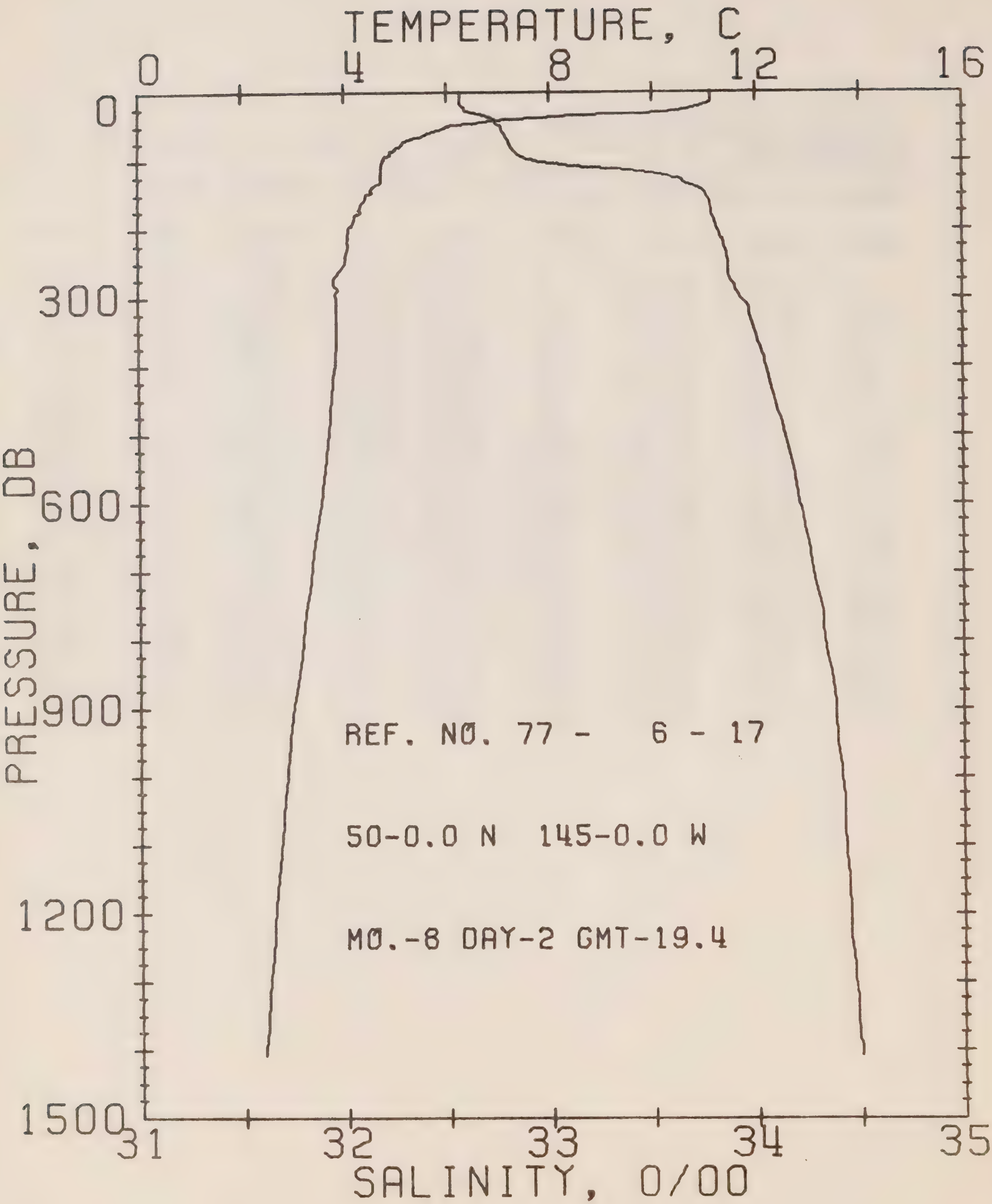
1500
REF. NØ. 77 - 6 - 13
49-49.0 N 142-40.0 W
MØ.-8 DAY-1 GMT-8.5
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 13 DATE 1/ 8/77 STATION 12
POSITION 49-49.0N, 142-40.0W GMT 8.5
RESULTS OF STP CAST 198 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.93	32.56	0	24.91	305.0	0.0	0.0	1491.
10	10.87	32.56	10	24.92	304.4	0.31	0.02	1491.
20	10.55	32.60	20	25.01	296.3	0.61	0.06	1490.
30	8.78	32.68	30	25.36	263.0	0.88	0.13	1483.
50	6.30	32.75	50	25.76	224.9	1.36	0.33	1474.
75	5.32	32.77	75	25.90	212.3	1.91	0.67	1471.
100	4.86	32.89	99	26.05	198.2	2.42	1.13	1469.
125	5.15	33.37	124	26.39	165.9	2.88	1.65	1471.
150	5.49	33.80	149	26.69	138.1	3.25	2.17	1474.
175	5.26	33.83	174	26.74	133.2	3.59	2.73	1473.
200	4.87	33.83	199	26.79	129.2	3.92	3.36	1472.
225	4.59	33.83	223	26.82	126.3	4.24	4.05	1471.
250	4.31	33.83	248	26.85	123.5	4.55	4.81	1471.
300	4.09	33.90	298	26.93	116.2	5.15	6.50	1471.
400	3.95	34.02	397	27.04	106.9	6.27	10.49	1472.
500	3.77	34.11	496	27.13	98.7	7.30	15.19	1473.
600	3.60	34.19	595	27.21	91.5	8.25	20.49	1474.
800	3.20	34.32	793	27.35	79.8	9.96	32.66	1476.
1000	2.88	34.39	990	27.43	72.2	11.47	46.50	1478.
1200	2.63	34.44	1188	27.50	66.7	12.86	62.03	1480.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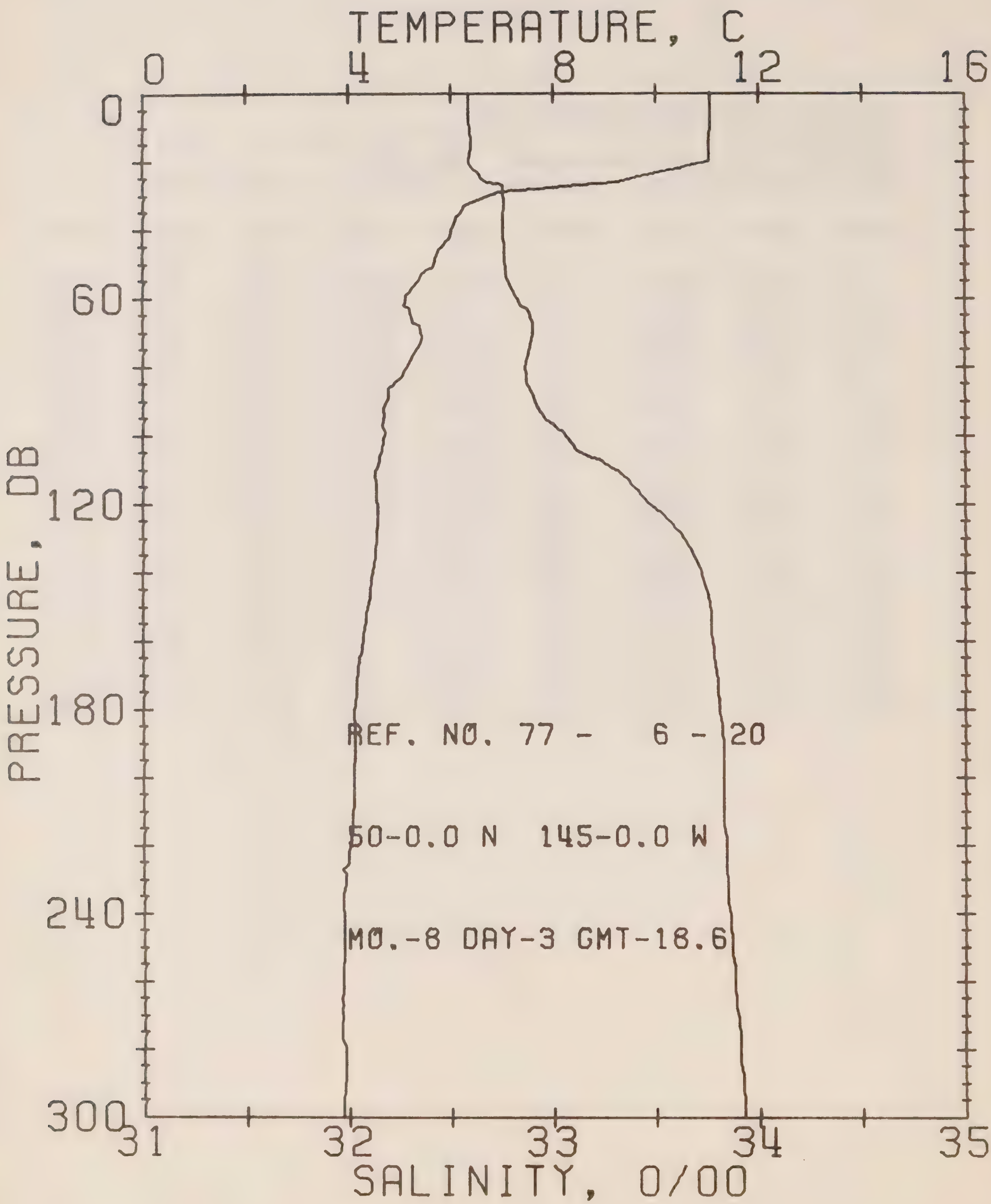
PRESSURE, DB
REF. NØ. 77 - 6 - 17
50-0.0 N 145-0.0 W
MØ.-8 DAY-2 GMT-19.4
31
32
33
34
35
SALINITY, 0/00

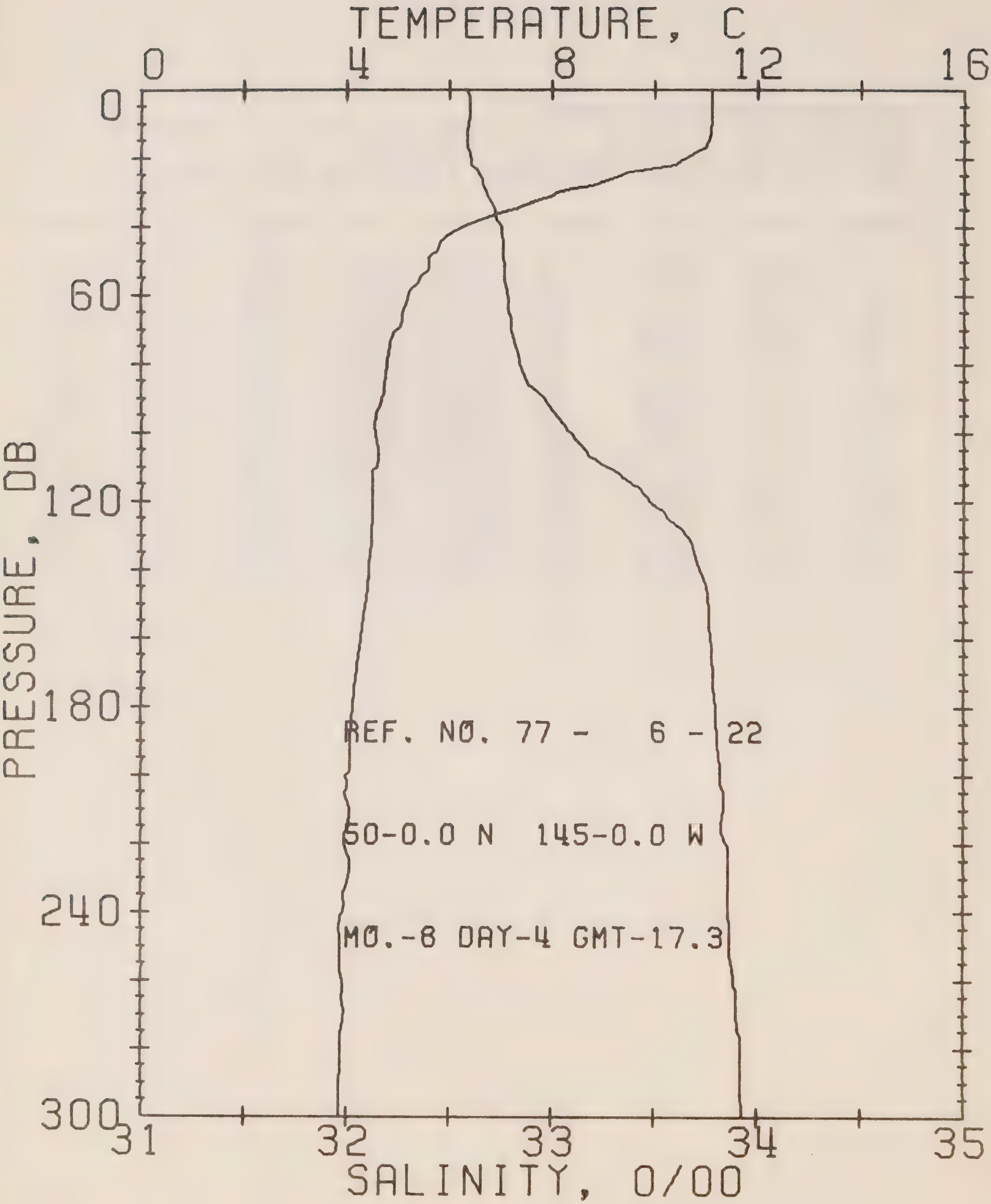
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 17 DATE 2/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 19.4
RESULTS OF STP CAST 192 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.15	32.57	0	24.88	307.9	0.0	0.0	1491.
10	11.14	32.57	10	24.88	308.2	0.31	0.02	1492.
20	11.02	32.57	20	24.91	306.3	0.62	0.06	1491.
30	10.30	32.62	30	25.07	291.0	0.92	0.14	1489.
50	6.06	32.75	50	25.80	221.7	1.41	0.34	1473.
75	5.14	32.80	75	25.94	208.0	1.94	0.68	1470.
100	4.75	32.92	99	26.08	194.9	2.45	1.13	1469.
125	4.73	33.60	124	26.62	144.1	2.87	1.61	1470.
150	4.42	33.76	149	26.78	129.0	3.21	2.08	1469.
175	4.32	33.79	174	26.82	126.0	3.53	2.61	1469.
200	4.09	33.81	199	26.86	122.2	3.84	3.20	1469.
225	4.06	33.85	223	26.89	119.2	4.14	3.85	1469.
250	4.00	33.87	248	26.91	117.3	4.44	4.57	1469.
300	3.84	33.92	298	26.97	112.3	5.01	6.18	1470.
400	3.80	34.04	397	27.07	103.4	6.08	9.99	1471.
500	3.68	34.14	496	27.16	95.7	7.08	14.55	1472.
600	3.51	34.21	595	27.23	89.6	8.00	19.73	1474.
800	3.15	34.33	793	27.36	78.2	9.67	31.58	1475.
1000	2.82	34.41	990	27.46	69.9	11.14	45.04	1477.
1200	2.58	34.45	1188	27.51	65.5	12.49	60.23	1480.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 20
50-0.0 N 145-0.0 W
MO.-8 DAY-3 GMT-18.6
31
32
33
34
35
SALINITY, 0/00

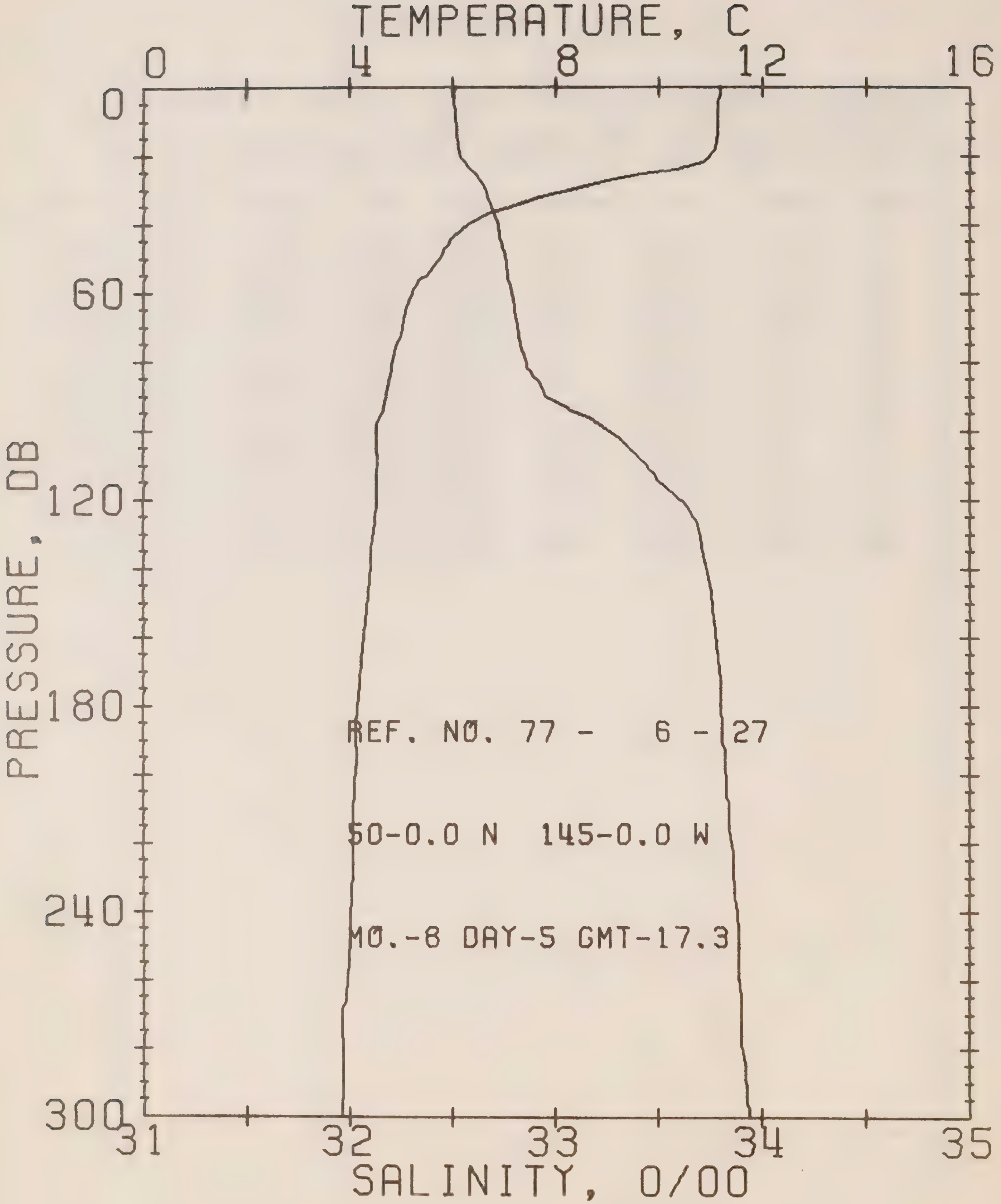
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 20 DATE 3/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 18.6
RESULTS OF STP CAST 120 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.06	32.59	0	24.91	304.9	0.0	0.0	1491.
10	11.06	32.59	10	24.92	305.0	0.31	0.02	1491.
20	11.03	32.59	20	24.92	305.0	0.61	0.06	1491.
30	6.76	32.75	30	25.71	230.2	0.88	0.13	1476.
50	5.66	32.76	50	25.85	216.5	1.32	0.31	1472.
75	5.31	32.88	75	25.99	203.5	1.84	0.64	1471.
100	4.69	33.05	99	26.19	184.4	2.33	1.08	1469.
125	4.56	33.56	124	26.61	144.9	2.74	1.54	1469.
150	4.35	33.76	149	26.79	128.2	3.08	2.01	1469.
175	4.12	33.80	174	26.84	123.2	3.39	2.53	1469.
200	4.09	33.83	199	26.87	120.8	3.69	3.11	1469.
225	3.97	33.84	223	26.89	119.0	3.99	3.76	1469.
250	3.89	33.87	248	26.92	116.2	4.29	4.47	1469.
300	3.88	33.93	298	26.97	112.0	4.86	6.07	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 22
50-0.0 N 145-0.0 W
MØ.-8 DAY-4 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

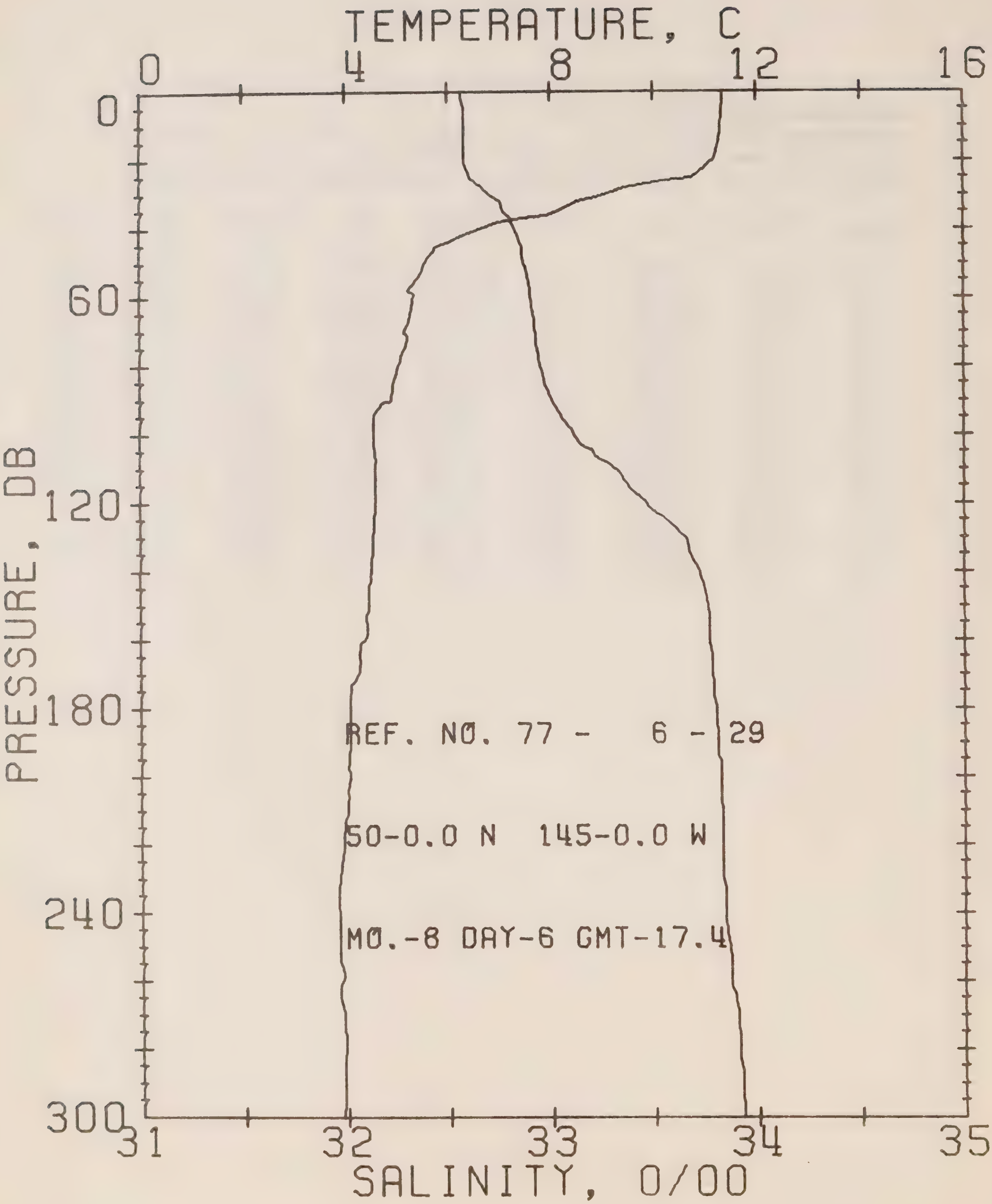
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 22 DATE 4/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.13	32.58	0	24.89	306.8	0.0	0.0	1491.
10	11.11	32.60	10	24.91	305.7	0.31	0.02	1491.
20	10.62	32.60	20	25.00	297.1	0.61	0.06	1490.
30	8.09	32.68	30	25.47	253.1	0.89	0.13	1481.
50	5.60	32.76	50	25.86	215.6	1.34	0.32	1471.
75	4.82	32.82	75	26.00	202.9	1.87	0.65	1469.
100	4.56	33.09	99	26.24	180.3	2.35	1.08	1468.
125	4.50	33.57	124	26.62	143.9	2.76	1.54	1469.
150	4.35	33.76	149	26.79	128.0	3.09	2.01	1469.
175	4.13	33.79	174	26.84	123.9	3.41	2.53	1469.
200	3.98	33.82	199	26.88	120.4	3.71	3.12	1468.
225	4.05	33.86	223	26.90	118.4	4.01	3.76	1469.
250	3.87	33.87	248	26.93	115.9	4.30	4.47	1469.
300	3.84	33.93	298	26.98	111.5	4.87	6.06	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 27
50-0.0 N 145-0.0 W
MO.-8 DAY-5 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 27 DATE 5/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 99 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.21	32.52	0	24.83	312.6	0.0	0.0	1492.
10	11.14	32.52	10	24.84	312.1	0.31	0.02	1491.
20	10.98	32.54	20	24.89	308.0	0.62	0.06	1491.
30	8.26	32.66	30	25.42	257.0	0.91	0.14	1481.
50	5.74	32.75	50	25.84	218.0	1.37	0.32	1472.
75	4.88	32.83	75	26.00	203.0	1.89	0.65	1469.
100	4.51	33.26	99	26.37	167.3	2.37	1.08	1468.
125	4.48	33.67	124	26.70	136.1	2.75	1.51	1469.
150	4.32	33.76	149	26.79	128.3	3.08	1.97	1469.
175	4.17	33.80	174	26.84	123.6	3.39	2.49	1469.
200	4.09	33.82	199	26.87	121.2	3.70	3.08	1469.
225	4.05	33.86	223	26.90	118.3	4.00	3.72	1469.
250	3.98	33.89	248	26.93	115.6	4.29	4.43	1469.
300	3.84	33.94	298	26.98	110.8	4.86	6.02	1470.


TEMPERATURE, C
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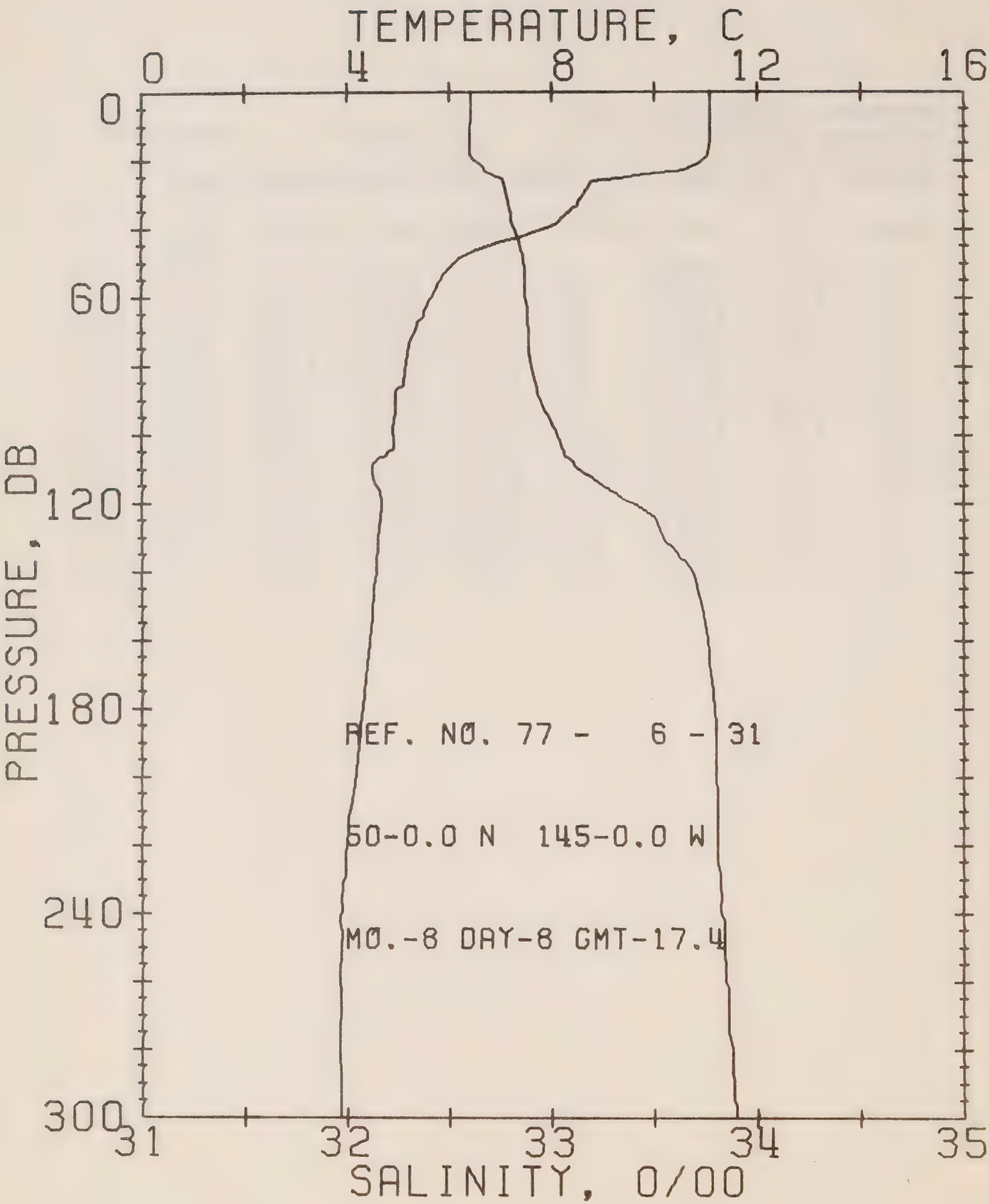
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NO. 77 - 6 - 29
50-0.0 N 145-0.0 W
MO.-8 DAY-6 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

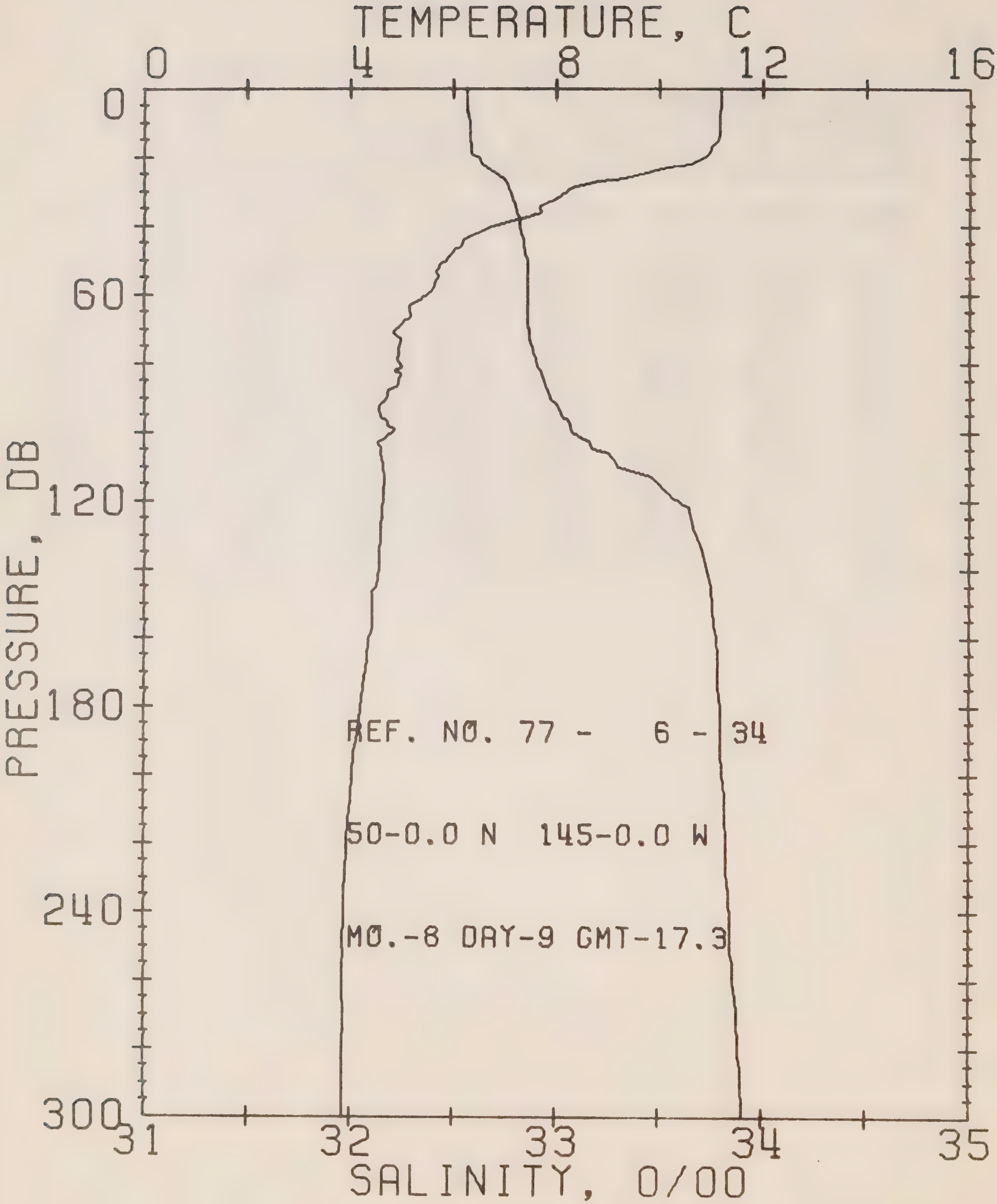
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 29 DATE 6/ 8/77 STATION P
POSITION 50- 0.0N. 145- 0.0W GMT 17.4
RESULTS OF STP CAST 130 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.37	32.57	0	24.84	311.7	0.0	0.0	1492.
10	11.30	32.58	10	24.86	310.2	0.31	0.02	1492.
20	11.17	32.58	20	24.89	308.1	0.62	0.06	1492.
30	9.04	32.70	30	25.34	265.4	0.91	0.14	1484.
50	5.53	32.87	50	25.95	206.8	1.37	0.32	1471.
75	5.15	32.93	75	26.05	198.1	1.87	0.64	1470.
100	4.53	33.11	99	26.25	178.5	2.35	1.06	1468.
125	4.53	33.56	124	26.61	145.0	2.75	1.53	1469.
150	4.43	33.76	149	26.78	129.4	3.09	2.00	1469.
175	4.07	33.79	174	26.84	123.3	3.41	2.52	1468.
200	4.04	33.82	199	26.87	121.0	3.71	3.11	1469.
225	3.87	33.83	223	26.89	118.8	4.01	3.75	1468.
250	3.83	33.86	248	26.92	116.3	4.30	4.47	1469.
300	3.90	33.93	298	26.97	112.2	4.88	6.07	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 31
50-0.0 N 145-0.0 W
MO.-8 DAY-8 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

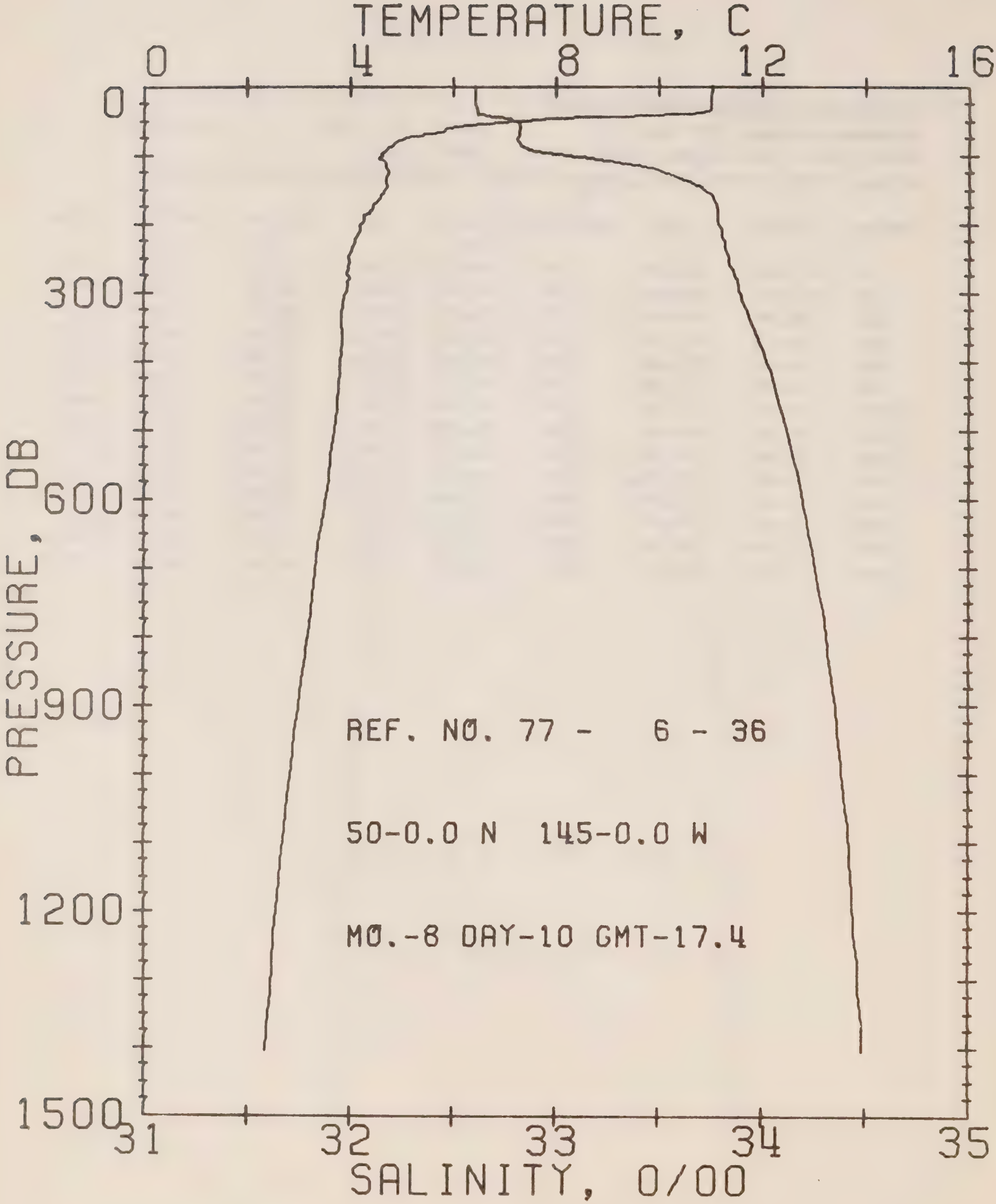
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 31 DATE 8/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 120 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.09	32.61	0	24.92	303.9	0.0	0.0	1491.
10	11.08	32.60	10	24.92	304.7	0.30	0.02	1491.
20	10.94	32.62	20	24.96	301.3	0.61	0.06	1491.
30	8.61	32.78	30	25.47	253.0	0.88	0.13	1483.
50	6.10	32.86	50	25.88	214.1	1.35	0.32	1473.
75	5.18	32.89	75	26.01	201.7	1.87	0.65	1470.
100	4.89	33.02	99	26.15	188.7	2.36	1.09	1470.
125	4.64	33.51	124	26.56	150.1	2.79	1.58	1470.
150	4.49	33.73	149	26.75	131.8	3.14	2.07	1470.
175	4.32	33.79	174	26.82	126.0	3.46	2.60	1469.
200	4.14	33.80	199	26.84	123.5	3.77	3.19	1469.
225	3.95	33.81	223	26.87	121.1	4.08	3.85	1469.
250	3.86	33.84	248	26.90	118.2	4.38	4.57	1469.
300	3.87	33.90	298	26.95	114.1	4.96	6.20	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 34
50-0.0 N 145-0.0 W
MO.-8 DAY-9 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 34 DATE 9/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 120 POINTS TAKEN FROM ANALOG TRACE

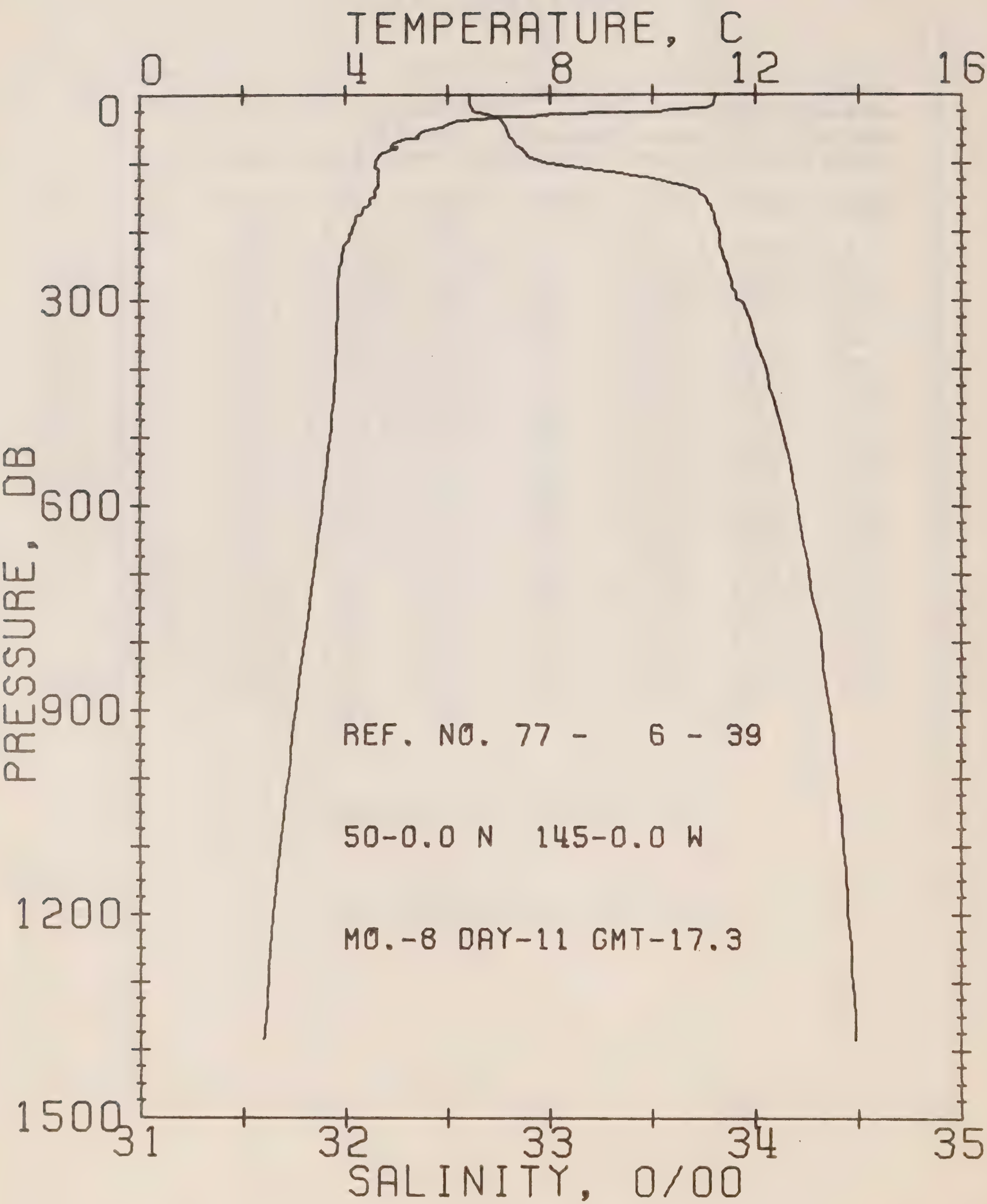
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.19	32.57	0	24.88	308.6	0.0	0.0	1492.
10	11.17	32.58	10	24.89	307.9	0.31	0.02	1492.
20	10.89	32.62	20	24.97	300.4	0.61	0.06	1491.
30	8.18	32.78	30	25.53	247.2	0.89	0.13	1481.
50	5.84	32.86	50	25.91	211.1	1.34	0.32	1472.
75	4.94	32.88	75	26.03	199.8	1.85	0.64	1469.
100	4.81	33.08	99	26.20	183.7	2.34	1.07	1469.
125	4.61	33.66	124	26.68	138.4	2.73	1.52	1470.
150	4.44	33.76	149	26.78	129.4	3.06	1.99	1469.
175	4.24	33.79	174	26.83	125.0	3.38	2.51	1469.
200	4.02	33.81	199	26.86	121.5	3.69	3.10	1469.
225	3.90	33.83	223	26.89	119.2	3.99	3.75	1469.
250	3.85	33.85	248	26.91	117.3	4.28	4.46	1469.
300	3.85	33.91	298	26.96	113.2	4.86	6.08	1470.



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 36
50-0.0 N 145-0.0 W
MO.-8 DAY-10 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 36 DATE 10/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 186 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.04	32.61	0	24.93	303.1	0.0	0.0	1491.
10	11.02	32.61	10	24.94	303.2	0.30	0.02	1491.
20	11.02	32.61	20	24.94	303.4	0.61	0.06	1491.
30	11.02	32.61	30	24.94	303.4	0.91	0.14	1492.
50	7.43	32.79	50	25.65	235.9	1.47	0.37	1479.
75	5.05	32.82	75	25.97	205.7	2.01	0.71	1470.
100	4.63	33.05	99	26.20	184.0	2.51	1.15	1469.
125	4.74	33.53	124	26.56	149.4	2.92	1.62	1470.
150	4.66	33.72	149	26.72	134.8	3.27	2.11	1470.
175	4.45	33.78	174	26.79	128.1	3.60	2.65	1470.
200	4.20	33.79	199	26.83	125.0	3.92	3.26	1469.
225	4.07	33.82	223	26.87	121.6	4.22	3.92	1469.
250	3.96	33.84	248	26.89	119.1	4.53	4.65	1469.
300	3.90	33.89	298	26.94	115.2	5.11	6.30	1470.
400	3.80	34.02	397	27.05	105.0	6.21	10.21	1471.
500	3.68	34.12	496	27.14	97.1	7.22	14.83	1472.
600	3.51	34.20	595	27.22	90.4	8.16	20.08	1474.
800	3.16	34.31	793	27.35	79.5	9.85	32.11	1475.
1000	2.83	34.39	990	27.44	71.5	11.35	45.89	1477.
1200	2.56	34.44	1188	27.51	65.7	12.72	61.17	1480.


TEMPERATURE, C
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4
8
12
16
0
300
600
900
1200
1500
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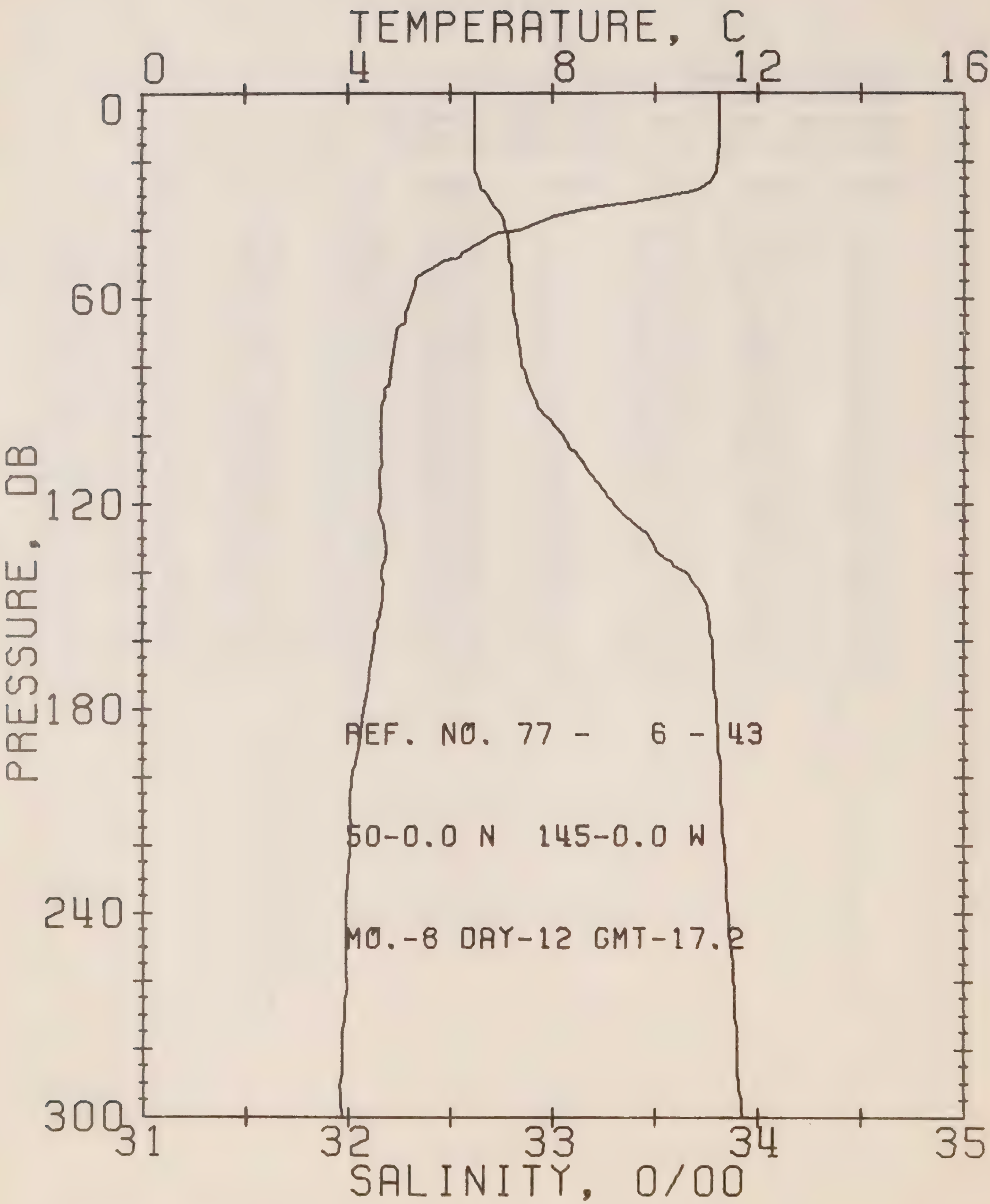
REF. NO. 77 - 6 - 39
50-0.0 N 145-0.0 W
MO.-8 DAY-11 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 39 DATE 11/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 174 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.22	32.61	0	24.90	306.1	0.0	0.0	1492.
10	11.19	32.61	10	24.91	306.1	0.31	0.02	1492.
20	11.06	32.62	20	24.93	303.6	0.61	0.06	1491.
30	7.92	32.70	30	25.50	249.4	0.89	0.13	1480.
50	5.70	32.79	50	25.87	214.7	1.34	0.32	1472.
75	4.89	32.84	75	26.00	202.3	1.86	0.65	1469.
100	4.58	32.99	99	26.15	188.1	2.36	1.09	1468.
125	4.65	33.53	124	26.58	148.3	2.77	1.56	1470.
150	4.56	33.75	149	26.76	131.2	3.12	2.04	147C.
175	4.28	33.80	174	26.83	124.8	3.44	2.57	1469.
200	4.10	33.82	199	26.86	121.7	3.75	3.16	1469.
225	3.96	33.83	223	26.89	119.5	4.05	3.81	1469.
250	3.88	33.86	248	26.92	116.8	4.34	4.53	1469.
300	3.84	33.92	298	26.97	112.3	4.92	6.13	1470.
400	3.79	34.05	397	27.08	102.8	5.99	9.95	1471.
500	3.68	34.14	496	27.16	95.8	6.98	14.50	1473.
600	3.53	34.21	595	27.23	89.7	7.91	19.70	1474.
800	3.17	34.32	793	27.35	79.1	9.60	31.75	1476.
1000	2.86	34.40	990	27.44	71.3	11.10	45.49	1478.
1200	2.57	34.45	1188	27.51	65.4	12.46	60.72	1480.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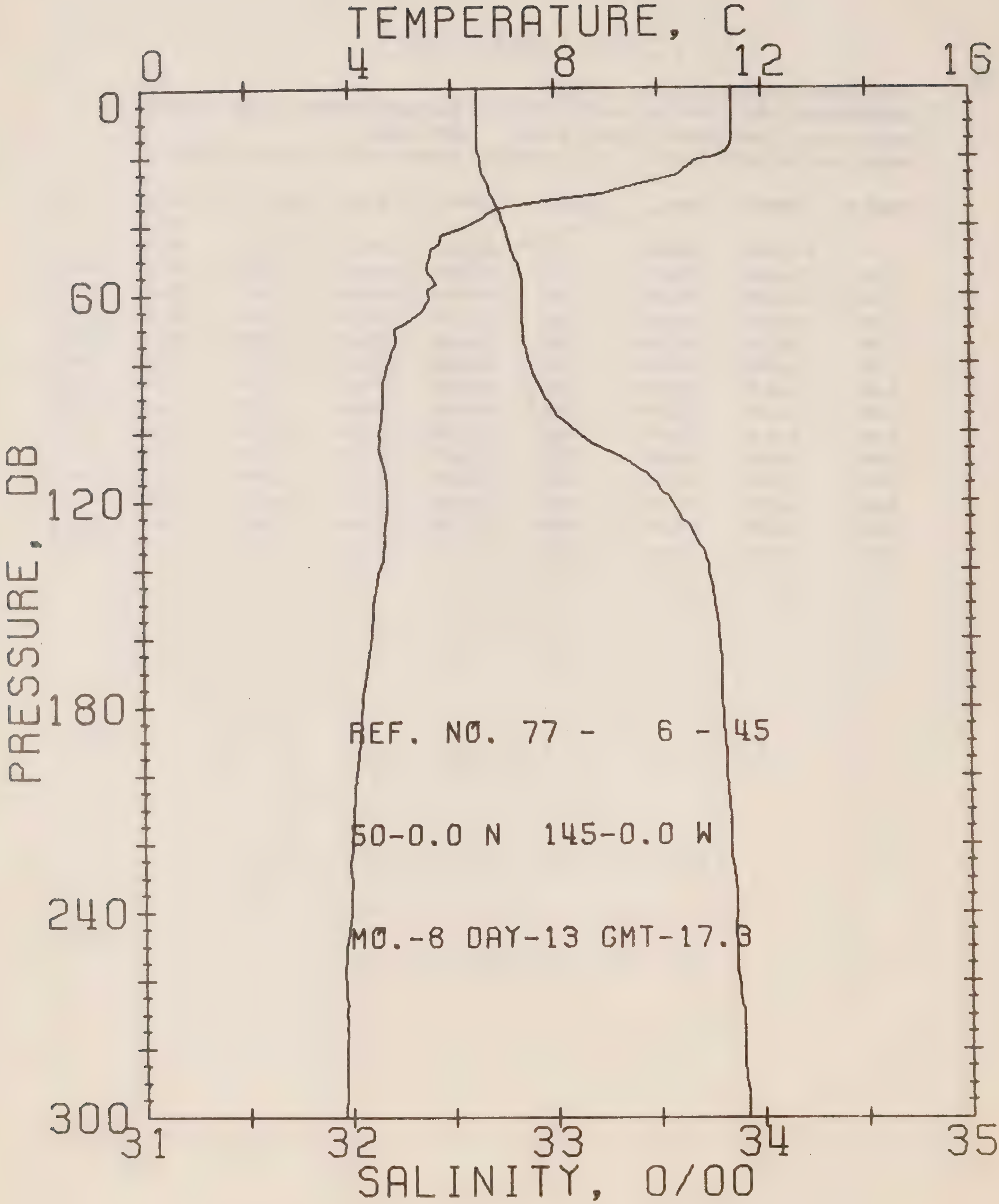
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 43
50-0.0 N 145-0.0 W
MO.-8 DAY-12 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 43 DATE 12/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 112 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.25	32.62	0	24.90	305.9	0.0	0.0	1492.
10	11.26	32.62	10	24.90	306.5	0.31	0.02	1492.
20	11.23	32.62	20	24.91	306.1	0.61	0.06	1492.
30	10.26	32.68	30	25.12	285.9	0.91	0.14	1489.
50	5.79	32.79	50	25.86	215.5	1.39	0.33	1472.
75	4.89	32.84	75	26.00	202.3	1.91	0.66	1469.
100	4.63	33.05	99	26.20	184.0	2.40	1.10	1469.
125	4.67	33.38	124	26.45	159.9	2.83	1.59	1470.
150	4.63	33.75	149	26.75	132.0	3.19	2.10	1470.
175	4.35	33.79	174	26.82	126.1	3.52	2.63	1470.
200	4.06	33.82	199	26.87	121.3	3.83	3.22	1469.
225	4.00	33.84	223	26.89	119.0	4.13	3.87	1469.
250	3.94	33.87	248	26.92	116.6	4.42	4.58	1469.
300	3.86	33.93	298	26.97	111.8	4.99	6.19	1470.


TEMPERATURE, C
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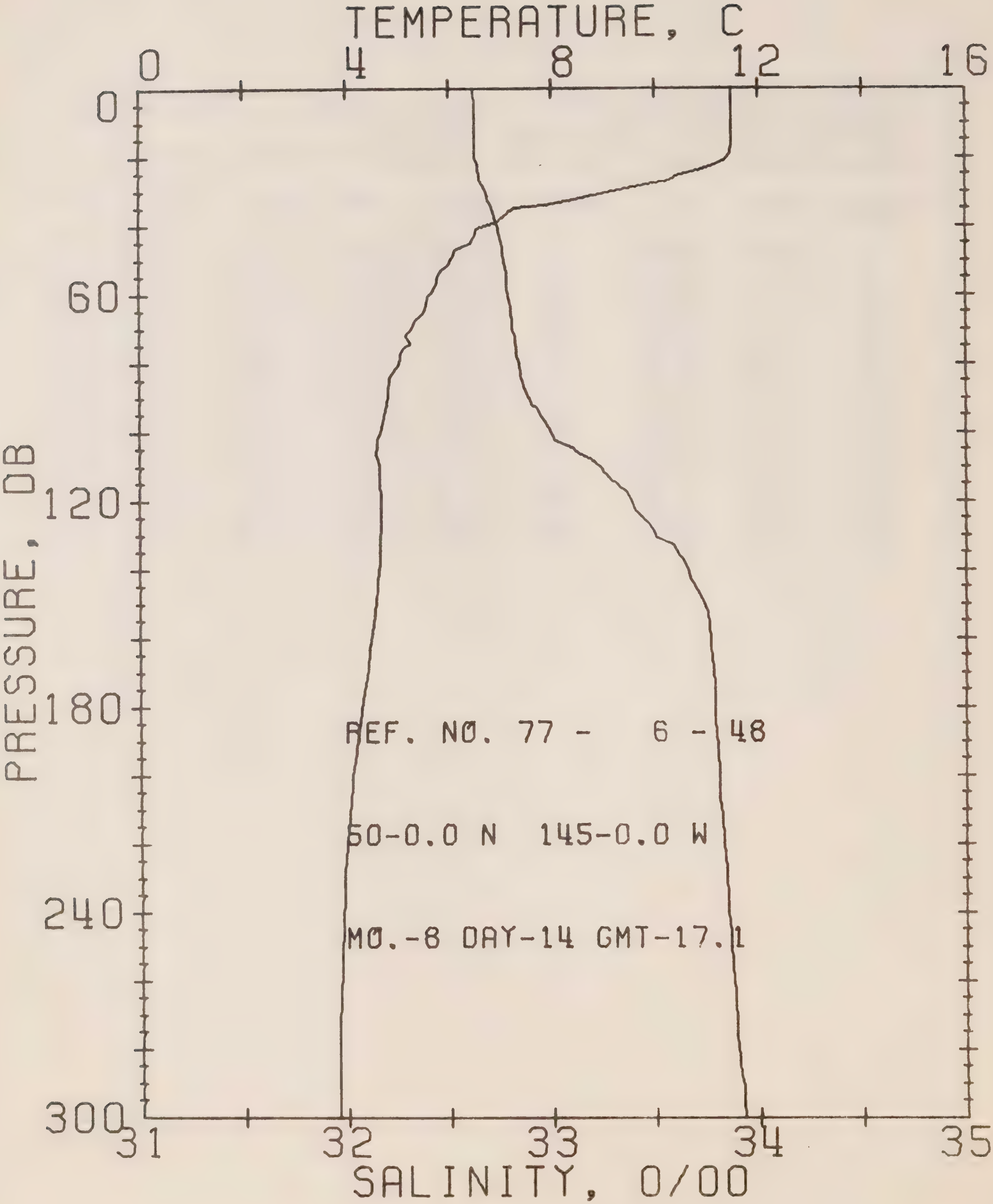
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 45
50-0.0 N 145-0.0 W
MO.-8 DAY-13 GMT-17.8
31
32
33
34
35
SALINITY, 0/00

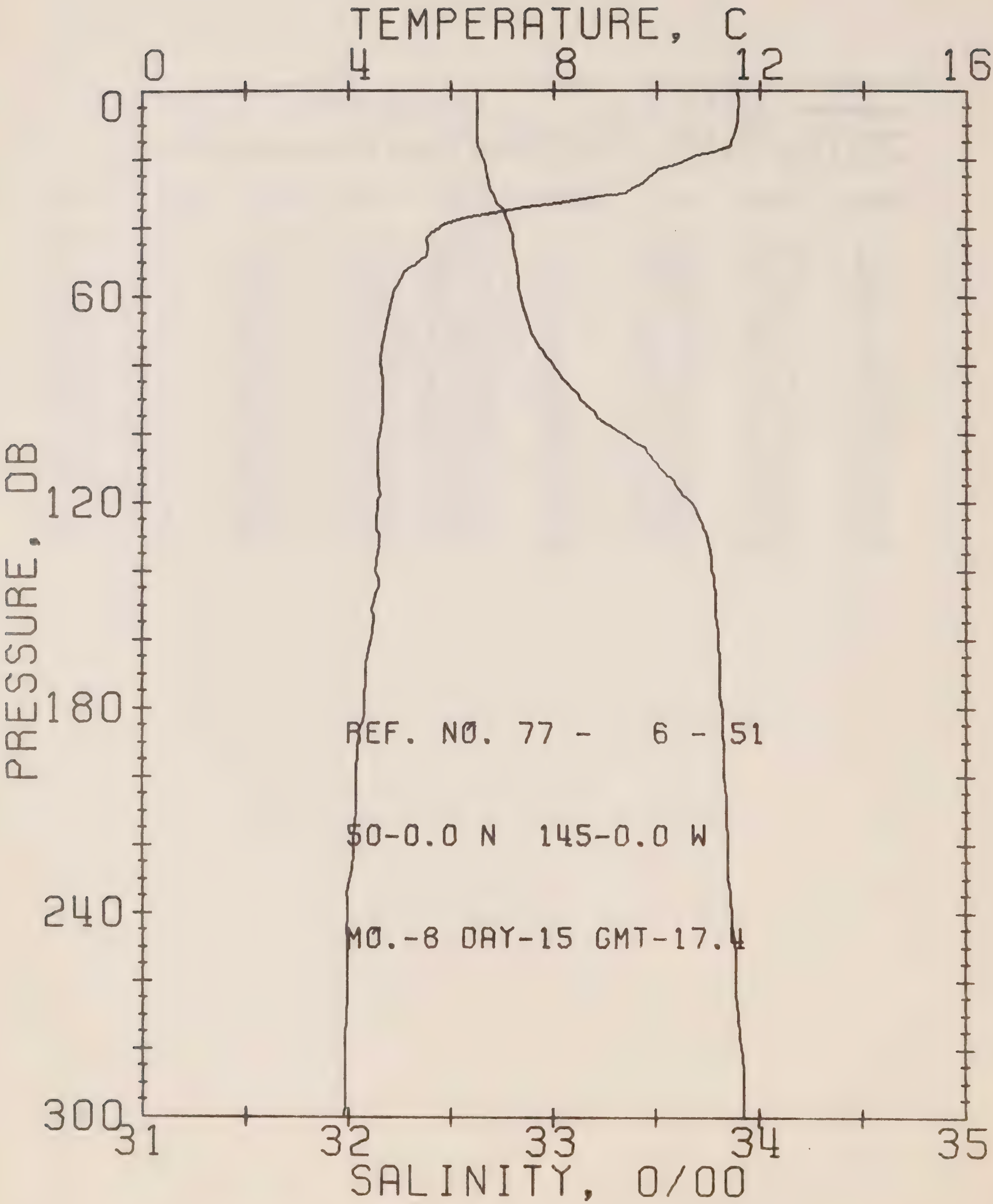
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 45 DATE 13/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.44	32.63	0	24.88	308.4	0.0	0.0	1493.
10	11.44	32.63	10	24.88	308.8	0.31	0.02	1493.
20	11.15	32.64	20	24.94	303.3	0.62	0.06	1492.
30	9.18	32.68	30	25.30	268.6	0.90	0.14	1485.
50	5.54	32.81	50	25.90	211.5	1.36	0.32	1471.
75	4.86	32.85	75	26.02	200.9	1.88	0.65	1469.
100	4.56	33.11	99	26.25	178.8	2.36	1.08	1468.
125	4.69	33.61	124	26.63	142.9	2.75	1.53	1470.
150	4.43	33.77	149	26.79	128.4	3.09	2.00	1469.
175	4.23	33.80	174	26.83	124.3	3.40	2.52	1469.
200	4.08	33.82	199	26.86	121.5	3.71	3.10	1469.
225	3.95	33.85	223	26.90	118.1	4.01	3.75	1469.
250	3.88	33.87	248	26.92	116.1	4.30	4.46	1469.
300	3.85	33.92	298	26.97	112.4	4.87	6.06	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 48
50-0.0 N 145-0.0 W
MØ.-8 DAY-14 GMT-17.1
31
32
33
34
35
SALINITY, 0/00

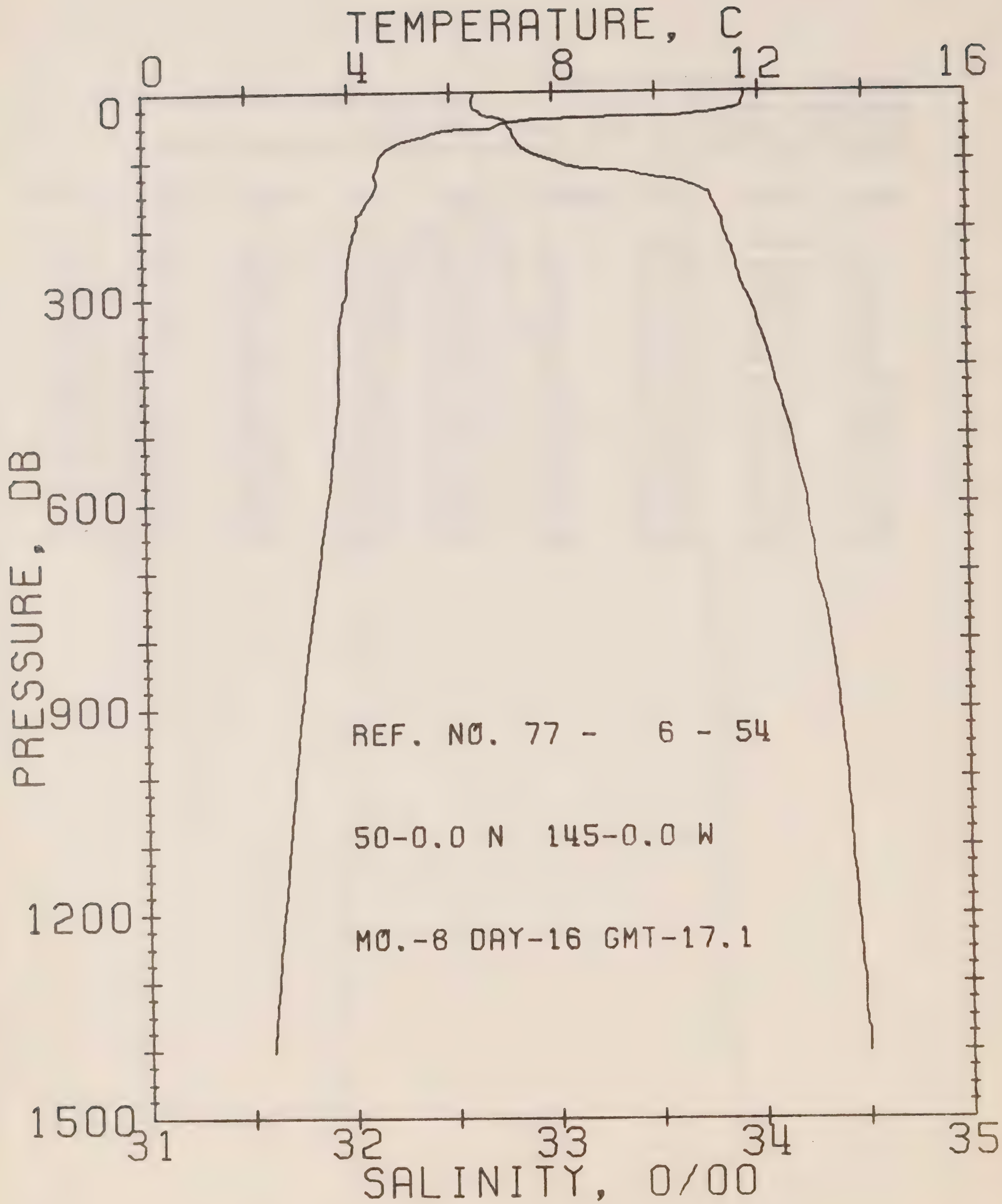
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 48 DATE 14/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.1
RESULTS OF STP CAST 104 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.49	32.62	0	24.86	310.0	0.0	0.0	1493.
10	11.49	32.63	10	24.87	309.8	0.31	0.02	1493.
20	11.41	32.63	20	24.88	308.5	0.62	0.06	1493.
30	9.16	32.68	30	25.30	268.7	0.91	0.14	1485.
50	6.02	32.77	50	25.81	220.2	1.38	0.33	1473.
75	5.17	32.82	75	25.96	206.5	1.91	0.67	1470.
100	4.64	32.99	99	26.15	188.6	2.41	1.11	1468.
125	4.66	33.43	124	26.50	155.7	2.83	1.59	1470.
150	4.55	33.73	149	26.75	132.5	3.19	2.09	1470.
175	4.32	33.79	174	26.82	126.0	3.51	2.62	1469.
200	4.09	33.81	199	26.86	122.3	3.82	3.22	1469.
225	3.95	33.84	223	26.89	119.1	4.13	3.87	1469.
250	3.88	33.86	248	26.92	116.8	4.42	4.58	1469.
300	3.82	33.93	298	26.98	111.3	4.99	6.13	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 51
50-0.0 N 145-0.0 W
MØ.-8 DAY-15 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 51 DATE 15/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 111 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.56	32.63	0	24.86	310.5	0.0	0.0	1493.
10	11.54	32.63	10	24.86	310.7	0.31	0.02	1493.
20	10.63	32.65	20	25.04	293.6	0.62	0.06	1490.
30	9.39	32.70	30	25.28	270.7	0.90	0.13	1486.
50	5.36	32.82	50	25.93	208.9	1.35	0.32	1470.
75	4.64	32.93	75	26.10	192.7	1.85	0.63	1468.
100	4.58	33.34	99	26.43	161.8	2.30	1.03	1469.
125	4.54	33.71	124	26.73	133.8	2.66	1.45	1469.
150	4.45	33.79	149	26.80	127.1	2.99	1.91	1470.
175	4.30	33.81	174	26.83	124.2	3.30	2.43	1469.
200	4.14	33.83	199	26.87	121.3	3.61	3.01	1469.
225	4.06	33.85	223	26.89	119.2	3.91	3.66	1469.
250	3.97	33.88	248	26.93	115.9	4.20	4.37	1469.
300	3.89	33.93	298	26.97	112.1	4.77	5.97	1470.


TEMPERATURE, C
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4
8
12
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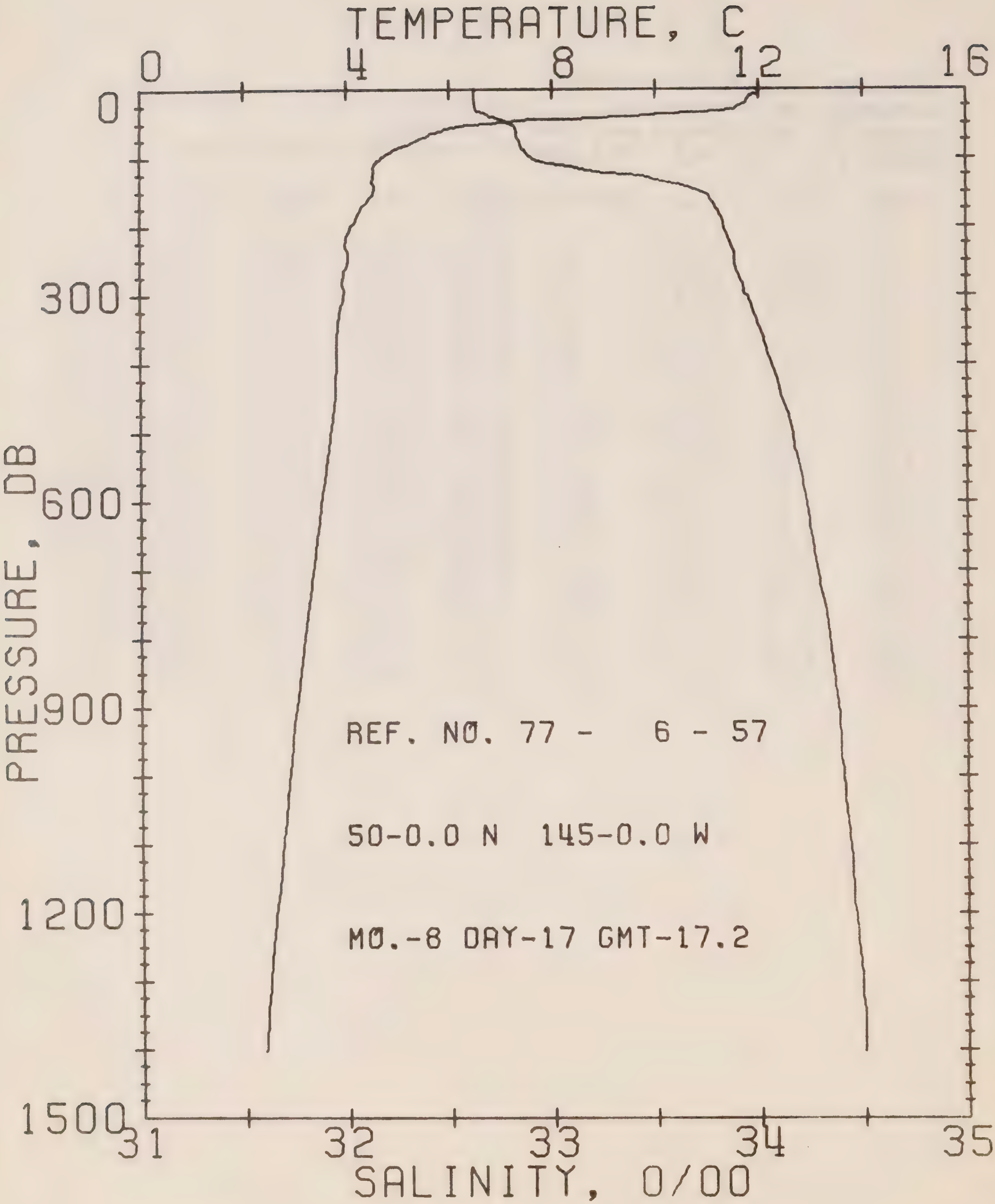
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 54
50-0.0 N 145-0.0 W
MØ.-8 DAY-16 GMT-17.1
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 54 DATE 16/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.1
RESULTS OF STP CAST 155 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.73	32.61	0	24.81	315.0	0.0	0.0	1494.
10	11.71	32.61	10	24.82	314.7	0.31	0.02	1494.
20	11.68	32.61	20	24.82	314.7	0.63	0.06	1494.
30	11.18	32.64	30	24.93	303.8	0.94	0.14	1492.
50	6.89	32.78	50	25.71	229.7	1.46	0.35	1477.
75	4.97	32.83	75	25.99	203.9	1.99	0.69	1469.
100	4.58	33.00	99	26.16	187.2	2.49	1.13	1468.
125	4.54	33.50	124	26.56	149.6	2.91	1.62	1469.
150	4.46	33.76	149	26.78	129.6	3.26	2.10	1470.
175	4.26	33.80	174	26.83	124.6	3.57	2.62	1469.
200	4.12	33.82	199	26.86	121.5	3.88	3.21	1469.
225	4.02	33.86	223	26.90	118.1	4.18	3.86	1469.
250	3.97	33.89	248	26.93	115.7	4.47	4.56	1469.
300	3.93	33.94	298	26.98	111.8	5.04	6.16	1470.
400	3.77	34.05	397	27.08	102.6	6.11	9.95	1471.
500	3.68	34.15	496	27.16	95.3	7.10	14.48	1473.
600	3.52	34.22	595	27.24	88.8	8.02	19.63	1474.
800	3.13	34.33	793	27.37	77.8	9.69	31.54	1475.
1000	2.85	34.41	990	27.45	70.3	11.17	45.07	1478.
1200	2.59	34.45	1188	27.51	65.4	12.53	60.31	1480.


TEMPERATURE, C
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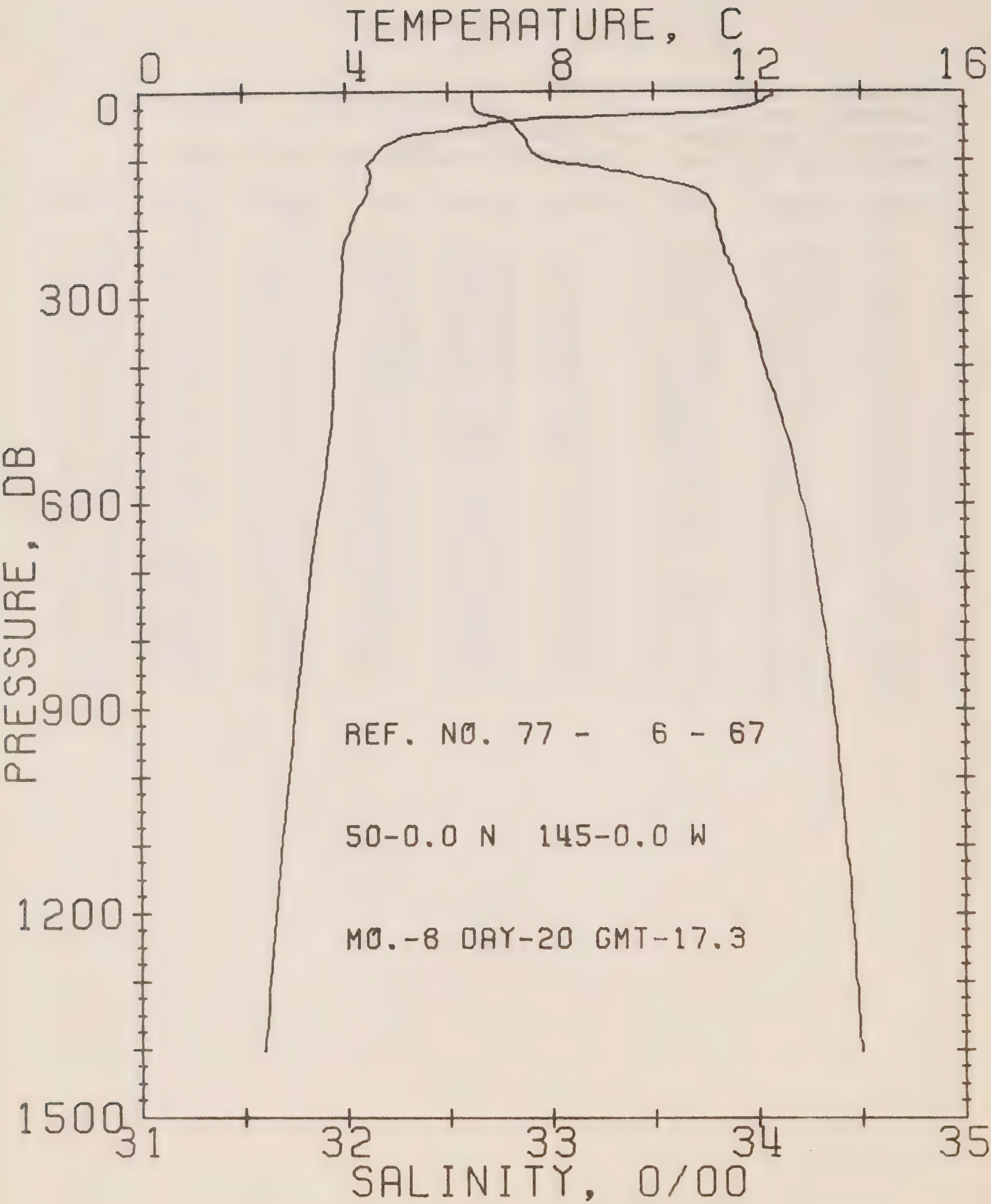
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 57
50-0.0 N 145-0.0 W
MO.-8 DAY-17 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 57 DATE 17/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 175 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.99	32.63	0	24.78	318.0	0.0	0.0	1494.
10	11.85	32.62	10	24.79	316.7	0.32	0.02	1494.
20	11.73	32.62	20	24.82	314.9	0.63	0.06	1494.
30	11.52	32.63	30	24.86	310.6	0.95	0.14	1493.
50	6.77	32.79	50	25.73	227.6	1.49	0.36	1476.
75	5.35	32.84	75	25.95	207.6	2.02	0.70	1471.
100	4.68	32.89	99	26.07	196.2	2.53	1.15	1469.
125	4.52	33.39	124	26.48	157.8	2.98	1.67	1469.
150	4.52	33.72	149	26.74	133.0	3.34	2.17	1470.
175	4.27	33.79	174	26.82	125.1	3.66	2.70	1469.
200	4.08	33.83	199	26.87	120.7	3.97	3.29	1469.
225	3.95	33.86	223	26.91	117.5	4.27	3.93	1469.
250	4.01	33.88	248	26.92	116.6	4.56	4.64	1469.
300	3.93	33.93	298	26.97	112.5	5.13	6.24	1470.
400	3.78	34.05	397	27.08	102.5	6.20	10.04	1471.
500	3.67	34.16	496	27.17	94.4	7.18	14.54	1472.
600	3.49	34.23	595	27.25	88.0	8.09	19.65	1473.
800	3.15	34.33	793	27.37	77.8	9.75	31.46	1475.
1000	2.84	34.40	990	27.45	70.8	11.23	45.01	1478.
1200	2.58	34.46	1188	27.51	65.0	12.59	60.21	1480.


TEMPERATURE, C
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4
8
12
16
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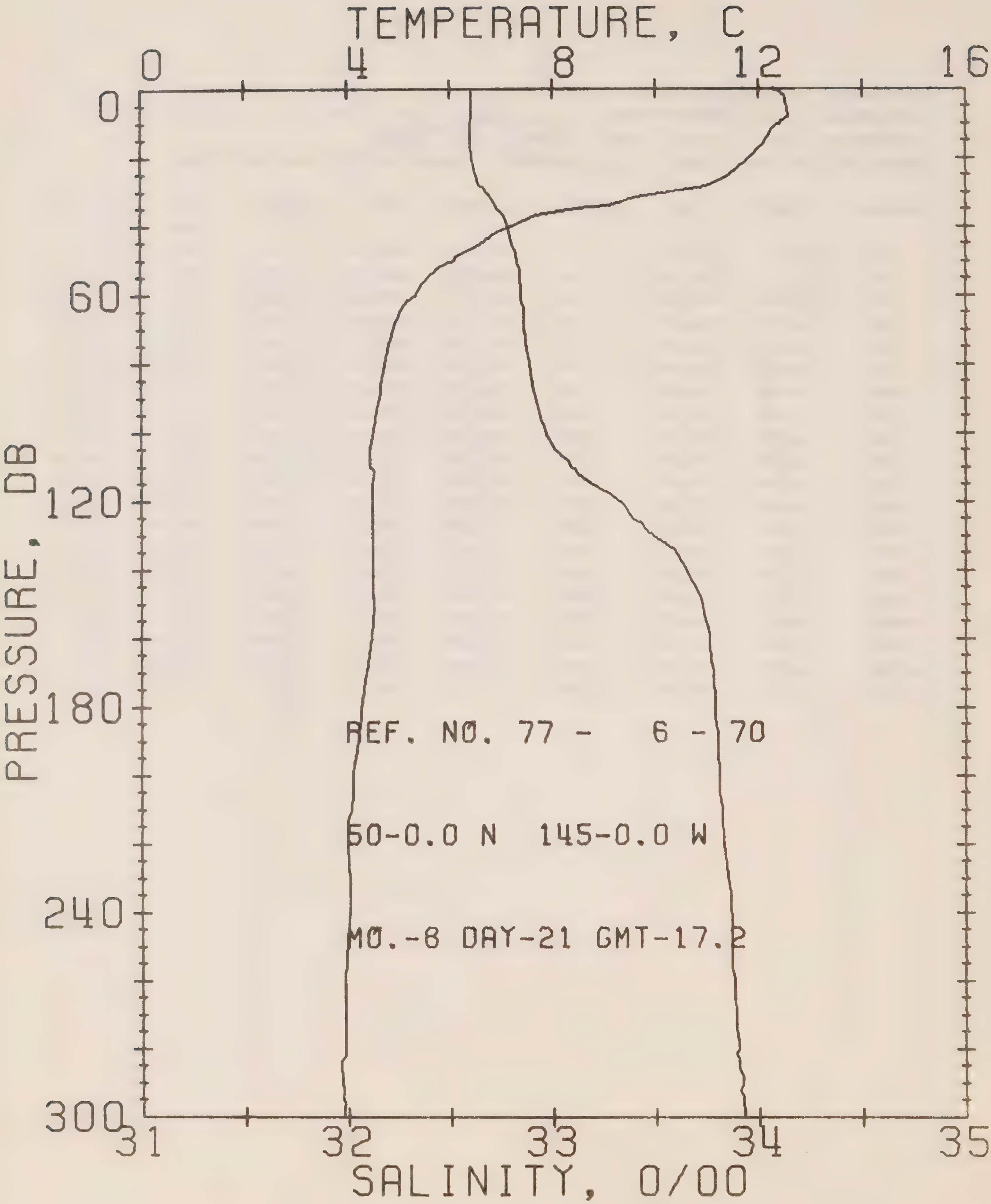
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 67
50-0.0 N 145-0.0 W
MO.-8 DAY-20 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 67 DATE 20/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 172 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.30	32.62	0	24.71	324.3	0.0	0.0	1496.
10	12.17	32.62	10	24.73	322.5	0.32	0.02	1495.
20	11.98	32.62	20	24.77	319.2	0.65	0.07	1495.
30	11.20	32.64	30	24.93	304.4	0.96	0.15	1492.
50	6.74	32.82	50	25.76	225.1	1.47	0.35	1476.
75	4.87	32.89	75	26.04	198.4	1.99	0.68	1469.
100	4.53	32.98	99	26.15	188.2	2.47	1.11	1468.
125	4.49	33.46	124	26.54	152.0	2.89	1.59	1469.
150	4.40	33.75	149	26.77	129.9	3.24	2.08	1469.
175	4.19	33.80	174	26.84	123.8	3.56	2.60	1469.
200	4.08	33.81	199	26.86	122.2	3.86	3.19	1469.
225	3.96	33.84	223	26.89	118.9	4.17	3.84	1469.
250	3.94	33.87	248	26.92	116.7	4.46	4.56	1469.
300	3.92	33.93	298	26.97	112.4	5.03	6.16	1470.
400	3.76	34.03	397	27.07	103.7	6.11	9.98	1471.
500	3.67	34.14	496	27.16	95.7	7.10	14.55	1472.
600	3.48	34.22	595	27.24	88.7	8.02	19.70	1473.
800	3.13	34.33	793	27.36	78.0	9.68	31.46	1475.
1000	2.85	34.40	990	27.44	71.2	11.17	45.08	1478.
1200	2.60	34.45	1188	27.51	65.5	12.53	60.35	1480.


TEMPERATURE, C
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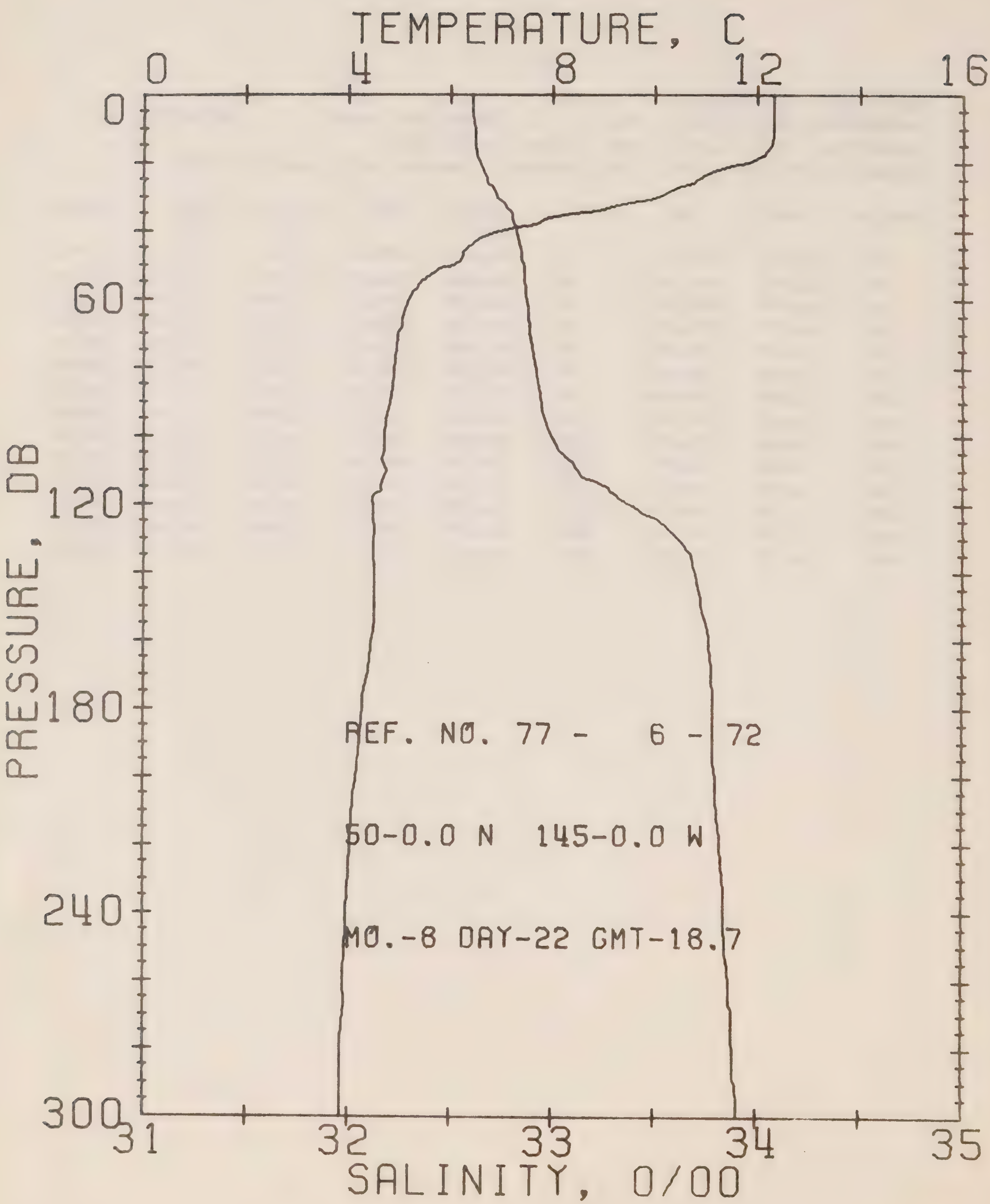
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 70
50-0.0 N 145-0.0 W
MØ.-8 DAY-21 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

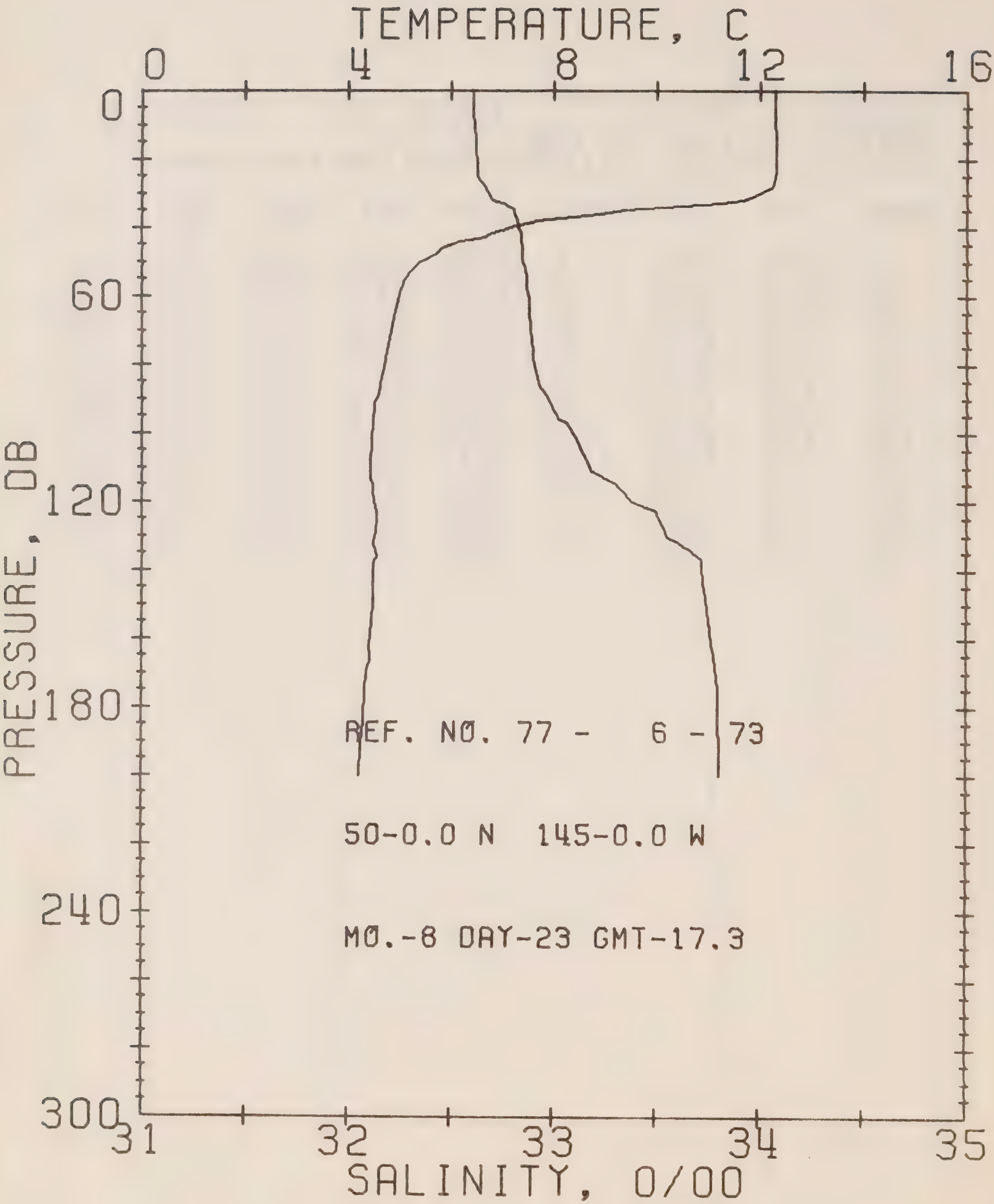
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 70   DATE 21/ 8/77   STATION P
POSITION 50- 0.0N, 145- 0.0W   GMT 17.2
RESULTS OF STP CAST   115 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.30	32.61	0	24.70	325.0	0.0	0.0	1496.
10	12.41	32.60	10	24.68	328.0	0.33	0.02	1496.
20	11.81	32.61	20	24.79	317.2	0.65	0.07	1494.
30	10.37	32.67	30	25.10	288.1	0.96	0.14	1489.
50	6.09	32.83	50	25.85	216.3	1.44	0.34	1473.
75	4.79	32.87	75	26.04	198.8	1.95	0.66	1469.
100	4.49	32.96	99	26.14	188.9	2.44	1.10	1468.
125	4.48	33.39	124	26.48	157.2	2.87	1.59	1469.
150	4.50	33.72	149	26.75	132.5	3.23	2.09	1470.
175	4.29	33.78	174	26.81	126.0	3.55	2.62	1469.
200	4.09	33.81	199	26.86	122.3	3.86	3.22	1469.
225	3.99	33.84	223	26.89	119.3	4.16	3.87	1469.
250	3.97	33.87	248	26.92	117.0	4.46	4.59	1469.
300	3.90	33.93	298	26.97	112.2	5.03	6.19	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 72
50-0.0 N 145-0.0 W
MO.-8 DAY-22 GMT-18.7
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 72 DATE 22/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 18.7
RESULTS OF STP CAST 117 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.31	32.61	0	24.70	325.2	0.0	0.0	1496.
10	12.32	32.62	10	24.70	325.3	0.33	0.02	1496.
20	11.80	32.64	20	24.82	314.6	0.65	0.07	1494.
30	10.04	32.73	30	25.20	278.6	0.94	0.14	1488.
50	6.05	32.86	50	25.88	213.6	1.41	0.33	1473.
75	4.93	32.90	75	26.05	197.9	1.92	0.65	1469.
100	4.69	32.99	99	26.14	189.2	2.41	1.09	1469.
125	4.49	33.53	124	26.59	147.1	2.84	1.58	1469.
150	4.51	33.73	149	26.75	132.2	3.18	2.05	1470.
175	4.29	33.79	174	26.82	125.8	3.50	2.59	1469.
200	4.13	33.80	199	26.84	123.6	3.81	3.18	1469.
225	4.00	33.83	223	26.88	120.2	4.12	3.84	1469.
250	3.91	33.85	248	26.90	118.0	4.41	4.56	1469.
300	3.84	33.91	298	26.96	113.1	4.99	6.18	1470.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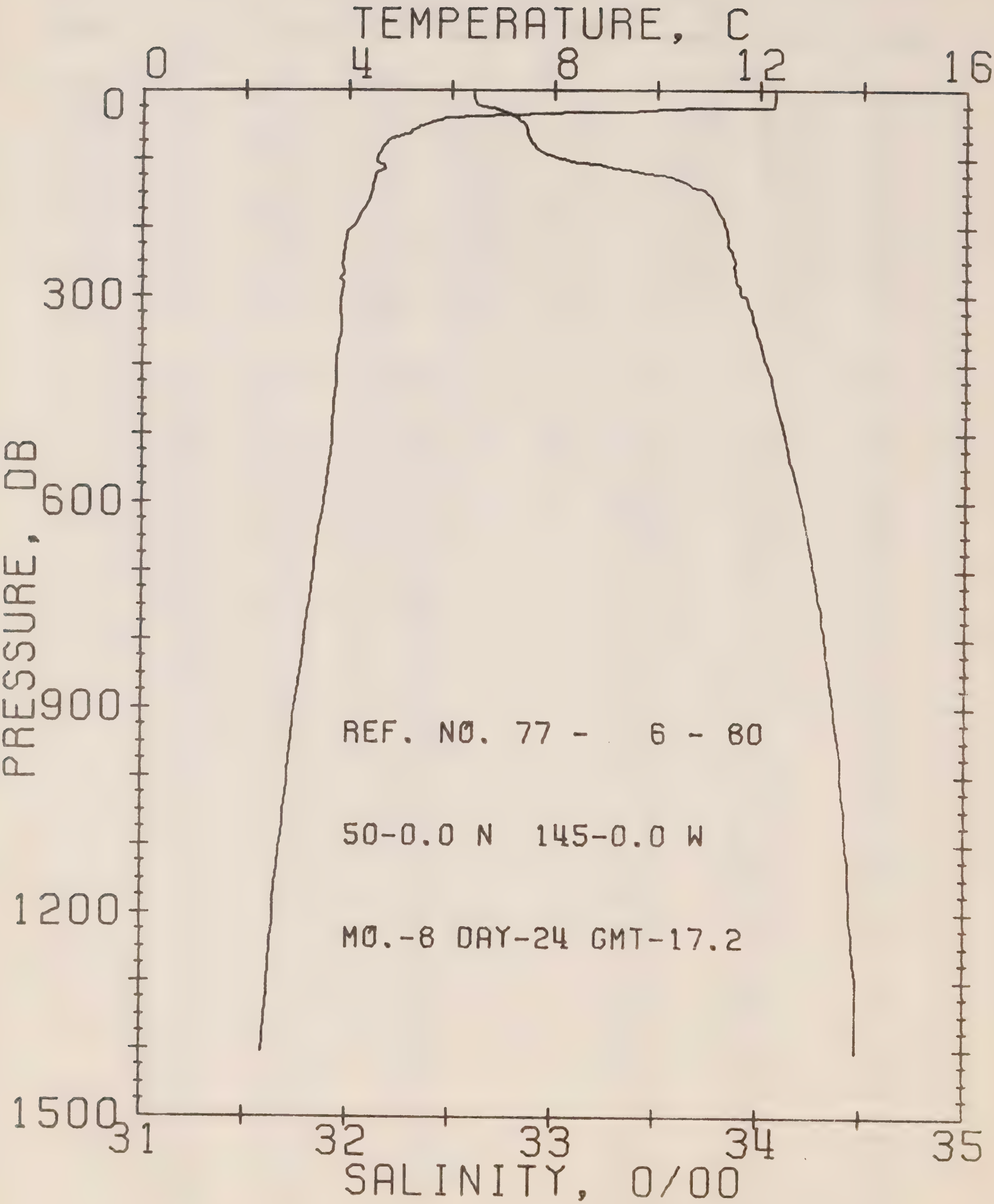
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 73
50-0.0 N 145-0.0 W
MØ.-8 DAY-23 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 73 DATE 23/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 76 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.30	32.61	0	24.70	325.0	0.0	0.0	1496.
10	12.31	32.61	10	24.70	325.4	0.33	0.02	1496.
20	12.31	32.63	20	24.71	324.9	0.65	0.07	1496.
30	12.01	32.68	30	24.81	315.7	0.97	0.15	1495.
50	5.40	32.85	50	25.95	206.9	1.46	0.34	1471.
75	4.76	32.90	75	26.06	196.6	1.96	0.66	1468.
100	4.46	33.09	99	26.25	179.4	2.44	1.08	1468.
125	4.55	33.51	124	26.57	149.1	2.85	1.56	1469.
150	4.47	33.74	149	26.76	130.8	3.19	2.04	1470.
175	4.33	33.80	174	26.82	125.3	3.51	2.57	1469.
200	4.21	33.81	199	26.84	123.5	3.83	3.16	1469.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	12.30	32.61	104.	4.45	33.13
4.	12.30	32.61	107.	4.44	33.15
7.	12.30	32.61	111.	4.44	33.18
15.	12.32	32.62	113.	4.44	33.24
16.	12.32	32.62	115.	4.47	33.30
23.	12.31	32.63	116.	4.49	33.32
25.	12.28	32.63	120.	4.51	33.38
28.	12.24	32.66	123.	4.55	33.50
31.	11.90	32.69	124.	4.56	33.50
32.	11.66	32.70	129.	4.53	33.54
33.	11.25	32.75	130.	4.51	33.55
35.	9.38	32.81	132.	4.48	33.61
36.	8.87	32.81	134.	4.53	33.66
38.	7.66	32.82	136.	4.55	33.70
40.	7.15	32.83	137.	4.52	33.72
42.	6.71	32.84	139.	4.49	33.72
43.	6.67	32.84	144.	4.47	33.73
44.	6.16	32.84	148.	4.47	33.74
46.	5.81	32.85	149.	4.47	33.74
48.	5.69	32.85	155.	4.45	33.75
50.	5.40	32.85	158.	4.43	33.76
52.	5.25	32.86	162.	4.40	33.77
55.	5.10	32.87	165.	4.44	33.78
58.	5.01	32.87	166.	4.42	33.78
61.	4.97	32.88	168.	4.36	33.79
64.	4.92	32.88	169.	4.35	33.79
70.	4.83	32.89	175.	4.33	33.80
76.	4.75	32.90	177.	4.32	33.80
78.	4.73	32.90	181.	4.30	33.80
81.	4.70	32.91	184.	4.29	33.80
85.	4.62	32.93	187.	4.28	33.80
86.	4.62	32.93	191.	4.25	33.81
89.	4.58	32.96	194.	4.24	33.81
91.	4.51	32.98	195.	4.23	33.81
92.	4.50	32.99	196.	4.21	33.81
96.	4.47	33.03	197.	4.21	33.81
97.	4.47	33.06	198.	4.22	33.81


TEMPERATURE, C
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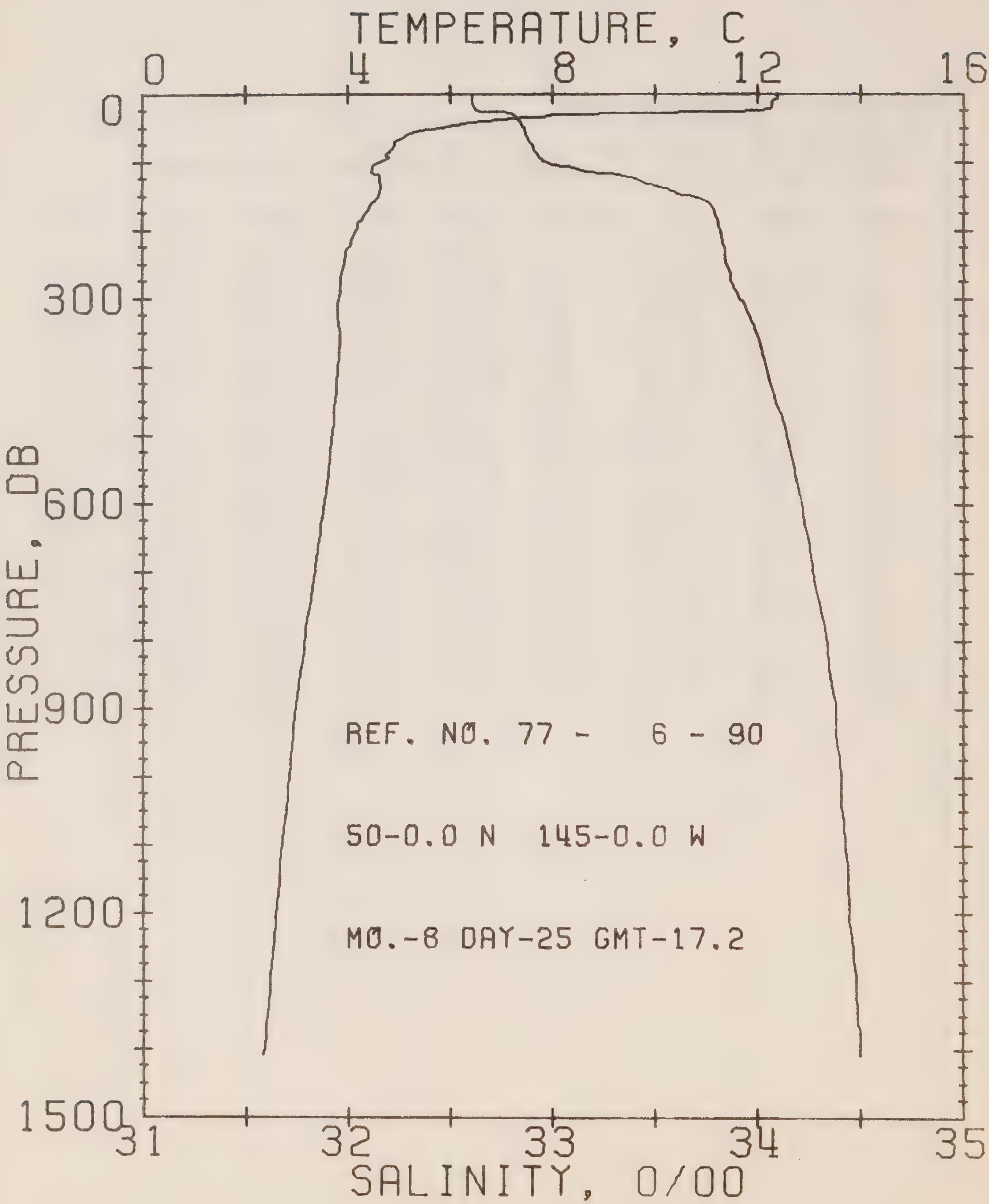
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NØ. 77 - 6 - 80
50-0.0 N 145-0.0 W
MØ.-8 DAY-24 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

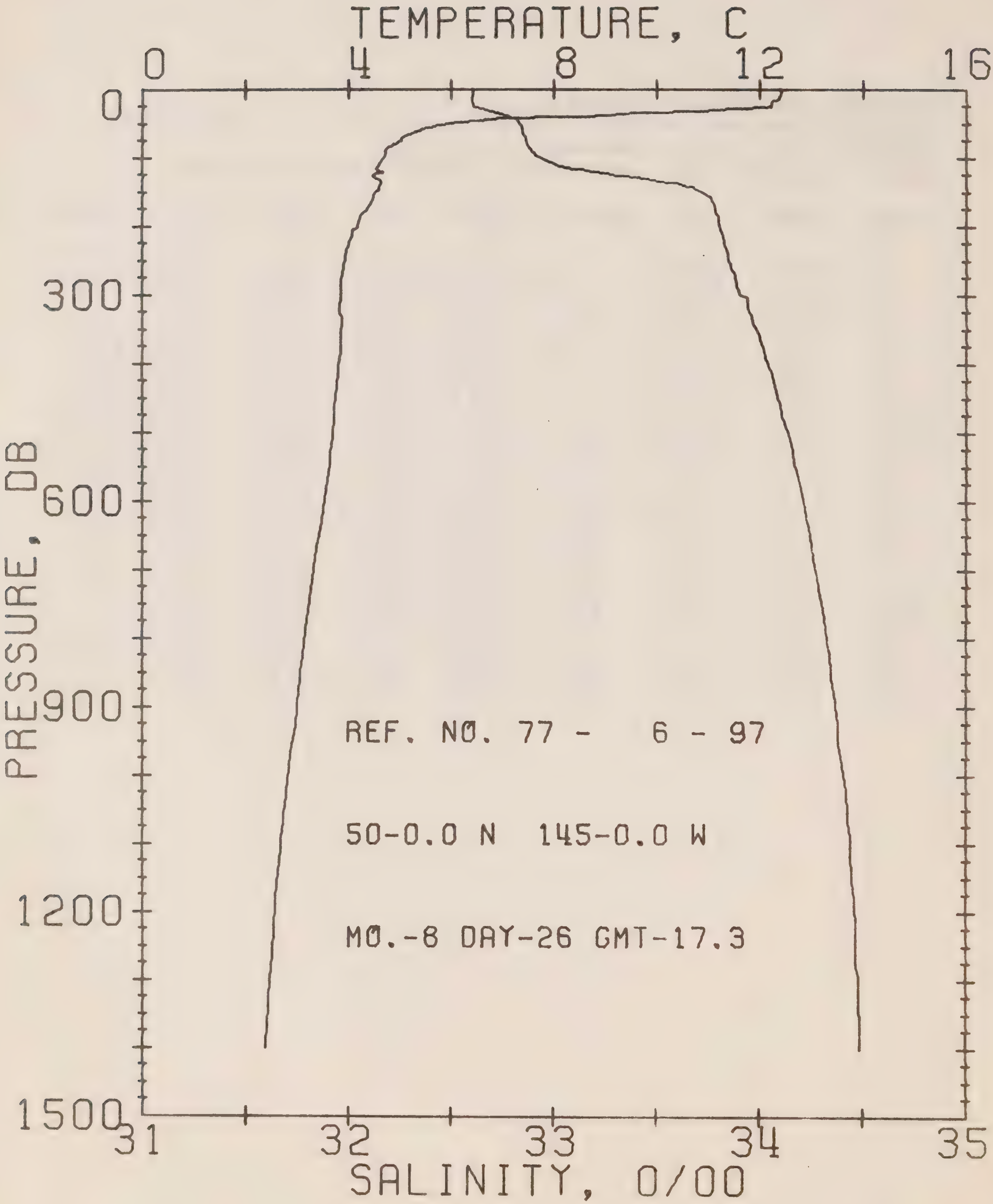
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 80 DATE 24/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 191 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.30	32.61	0	24.70	325.0	0.0	0.0	1496.
10	12.28	32.61	10	24.71	325.2	0.33	0.02	1496.
20	12.27	32.62	20	24.71	324.6	0.65	0.07	1496.
30	9.99	32.73	30	25.21	277.4	0.96	0.14	1488.
50	5.52	32.85	50	25.94	208.0	1.41	0.33	1471.
75	4.75	32.88	75	26.05	197.6	1.92	0.65	1468.
100	4.53	33.03	99	26.19	184.8	2.40	1.08	1468.
125	4.50	33.54	124	26.60	146.2	2.82	1.56	1469.
150	4.43	33.74	149	26.76	130.7	3.16	2.04	1469.
175	4.28	33.79	174	26.82	125.2	3.48	2.57	1469.
200	4.06	33.83	199	26.88	120.4	3.79	3.15	1469.
225	3.92	33.85	223	26.91	117.7	4.09	3.79	1469.
250	3.88	33.88	248	26.93	115.3	4.38	4.50	1469.
300	3.87	33.92	298	26.97	112.6	4.95	6.11	1470.
400	3.76	34.03	397	27.06	104.1	6.03	9.95	1471.
500	3.67	34.13	496	27.15	96.7	7.03	14.54	1472.
600	3.52	34.20	595	27.22	90.3	7.97	19.79	1474.
800	3.15	34.32	793	27.36	78.7	9.65	31.75	1475.
1000	2.83	34.40	990	27.45	70.7	11.14	45.37	1477.
1200	2.56	34.45	1188	27.51	65.3	12.49	60.54	1480.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 90
50-0.0 N 145-0.0 W
MØ.-8 DAY-25 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

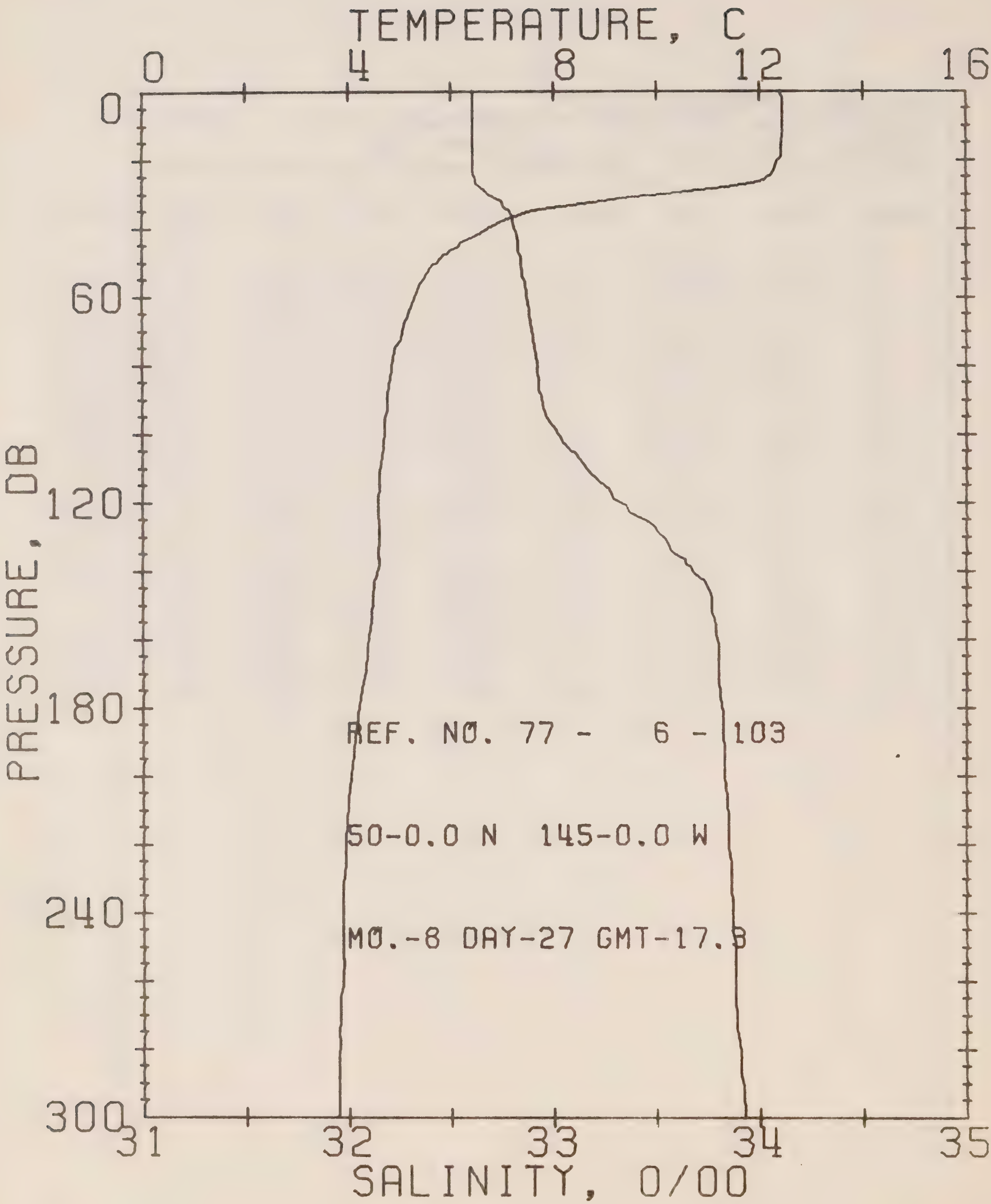
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 90 DATE 25/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 222 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.36	32.61	0	24.69	326.1	0.0	0.0	1496.
10	12.32	32.61	10	24.70	325.8	0.33	0.02	1496.
20	12.26	32.61	20	24.71	324.7	0.65	0.07	1496.
30	8.24	32.80	30	25.54	246.3	0.95	0.14	1481.
50	5.87	32.86	50	25.90	211.5	1.41	0.33	1473.
75	4.89	32.90	75	26.05	198.1	1.91	0.65	1469.
100	4.63	32.96	99	26.13	190.5	2.40	1.08	1468.
125	4.62	33.40	124	26.47	157.9	2.84	1.58	1469.
150	4.59	33.67	149	26.70	137.2	3.21	2.10	1470.
175	4.33	33.79	174	26.82	126.1	3.53	2.64	1469.
200	4.14	33.81	199	26.85	122.5	3.84	3.23	1469.
225	3.99	33.83	223	26.89	119.7	4.14	3.38	1469.
250	3.91	33.85	248	26.90	118.1	4.44	4.60	1469.
300	3.82	33.91	298	26.96	112.9	5.02	6.22	1470.
400	3.80	34.04	397	27.07	103.8	6.09	10.05	1471.
500	3.66	34.14	496	27.16	95.6	7.09	14.61	1472.
600	3.52	34.21	595	27.23	89.3	8.02	19.80	1474.
800	3.13	34.34	793	27.37	77.5	9.69	31.67	1475.
1000	2.83	34.41	990	27.45	70.0	11.16	45.15	1477.
1200	2.57	34.45	1188	27.51	65.5	12.52	60.36	1480.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 97
50-0.0 N 145-0.0 W
MO.-8 DAY-26 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6- 97 DATE 26/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 208 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.39	32.61	0	24.69	326.7	0.0	0.0	1496.
10	12.41	32.61	10	24.68	327.5	0.33	0.02	1496.
20	12.24	32.60	20	24.71	325.2	0.65	0.07	1496.
30	11.11	32.67	30	24.97	300.6	0.97	0.15	1492.
50	5.94	32.83	50	25.87	214.6	1.48	0.35	1473.
75	5.00	32.86	75	26.01	202.0	1.99	0.68	1469.
100	4.67	32.93	99	26.10	193.3	2.49	1.12	1469.
125	4.46	33.30	124	26.41	163.8	2.94	1.64	1469.
150	4.51	33.72	149	26.74	132.9	3.31	2.15	1470.
175	4.35	33.78	174	26.81	126.7	3.63	2.68	1470.
200	4.16	33.80	199	26.84	123.4	3.94	3.28	1469.
225	3.99	33.83	223	26.88	120.0	4.25	3.94	1469.
250	3.90	33.85	248	26.91	117.7	4.54	4.65	1469.
300	3.84	33.91	298	26.96	113.1	5.12	6.27	1470.
400	3.80	34.04	397	27.07	103.9	6.20	10.12	1471.
500	3.67	34.14	496	27.16	96.0	7.20	14.69	1472.
600	3.52	34.21	595	27.23	89.5	8.13	19.88	1474.
800	3.14	34.33	793	27.36	78.3	9.80	31.76	1475.
1000	2.82	34.41	990	27.45	70.2	11.28	45.35	1477.
1200	2.56	34.46	1188	27.52	64.3	12.62	60.33	1480.


TEMPERATURE, C
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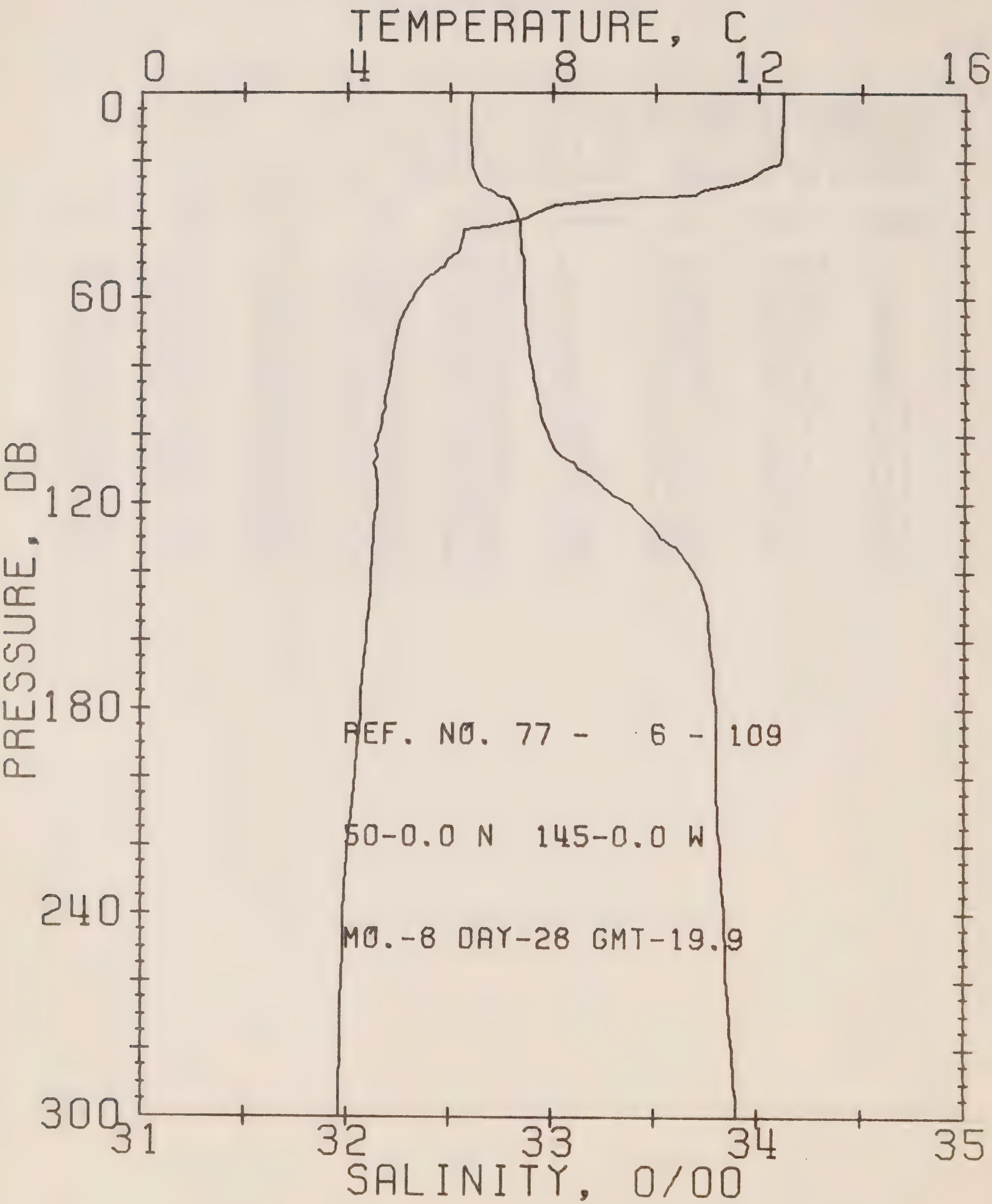
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 103
50-0.0 N 145-0.0 W
MØ.-8 DAY-27 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

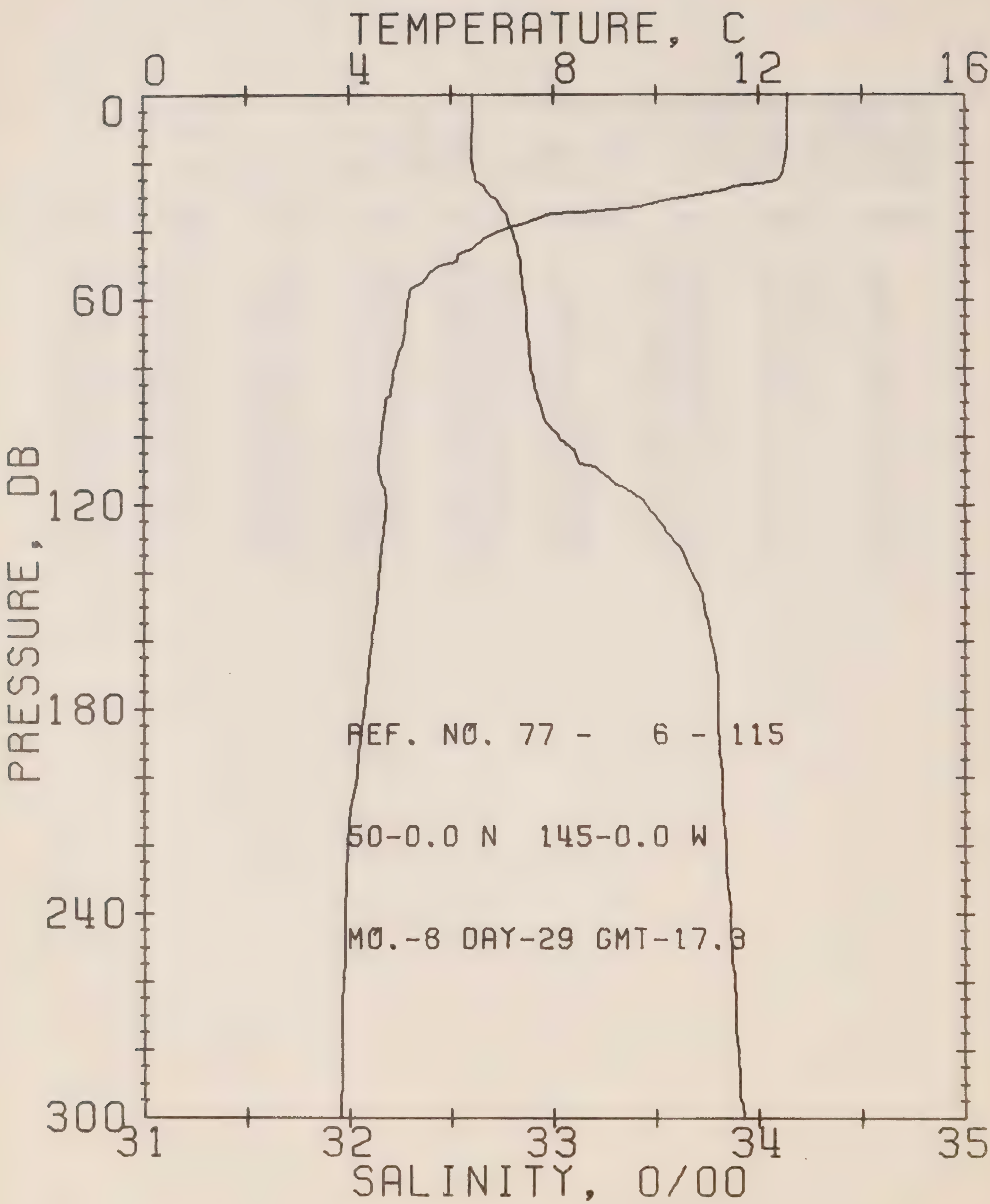
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-103 DATE 27/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.41	32.61	0	24.68	327.0	0.0	0.0	1496.
10	12.45	32.61	10	24.67	328.2	0.33	0.02	1496.
20	12.34	32.61	20	24.69	326.4	0.66	0.07	1496.
30	10.15	32.68	30	25.14	284.1	0.97	0.15	1488.
50	5.72	32.84	50	25.91	211.3	1.44	0.33	1472.
75	4.87	32.91	75	26.06	196.9	1.94	0.56	1469.
100	4.67	33.02	99	26.17	186.7	2.43	1.09	1469.
125	4.58	33.44	124	26.51	154.8	2.86	1.58	1469.
150	4.44	33.77	149	26.79	128.5	3.21	2.07	1469.
175	4.23	33.81	174	26.84	123.9	3.52	2.59	1469.
200	4.03	33.83	199	26.88	120.2	3.83	3.17	1469.
225	3.91	33.86	223	26.91	117.1	4.12	3.81	1469.
250	3.86	33.88	248	26.93	115.1	4.41	4.52	1469.
300	3.77	33.93	298	26.98	110.8	4.98	6.11	1469.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 109
50-0.0 N 145-0.0 W
MØ.-8 DAY-28 GMT-19.9
31
32
33
34
35
SALINITY, 0/00

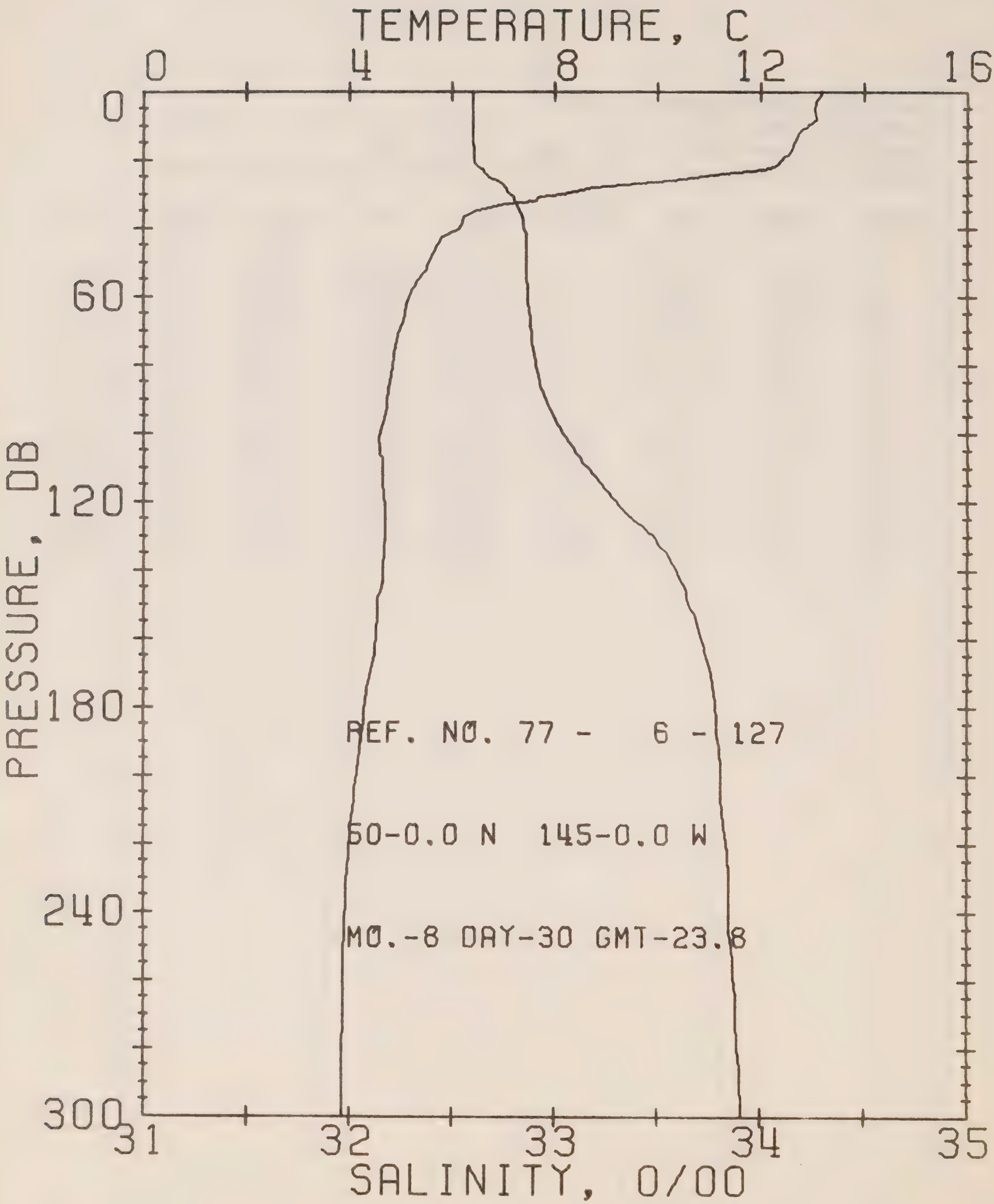
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-109 DATE 28/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 19.9
RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.47	32.61	0	24.67	328.1	0.0	0.0	1496.
10	12.46	32.60	10	24.66	329.2	0.33	0.02	1496.
20	12.41	32.61	20	24.68	327.8	0.66	0.07	1496.
30	10.78	32.73	30	25.07	290.7	0.97	0.15	1491.
50	5.90	32.86	50	25.90	211.9	1.43	0.33	1473.
75	4.90	32.89	75	26.04	198.8	1.94	0.66	1469.
100	4.58	32.98	99	26.15	188.8	2.42	1.09	1468.
125	4.52	33.45	124	26.53	152.8	2.86	1.58	1469.
150	4.44	33.75	149	26.77	129.9	3.20	2.06	1469.
175	4.28	33.79	174	26.82	125.5	3.52	2.59	1469.
200	4.15	33.80	199	26.84	123.7	3.83	3.19	1469.
225	3.98	33.82	223	26.87	120.6	4.14	3.85	1469.
250	3.91	33.85	248	26.91	117.8	4.43	4.57	1469.
300	3.84	33.90	298	26.95	113.8	5.01	6.19	1470.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NØ. 77 - 6 - 115
50-0.0 N 145-0.0 W
MØ.-8 DAY-29 GMT-17.8
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-115 DATE 29/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

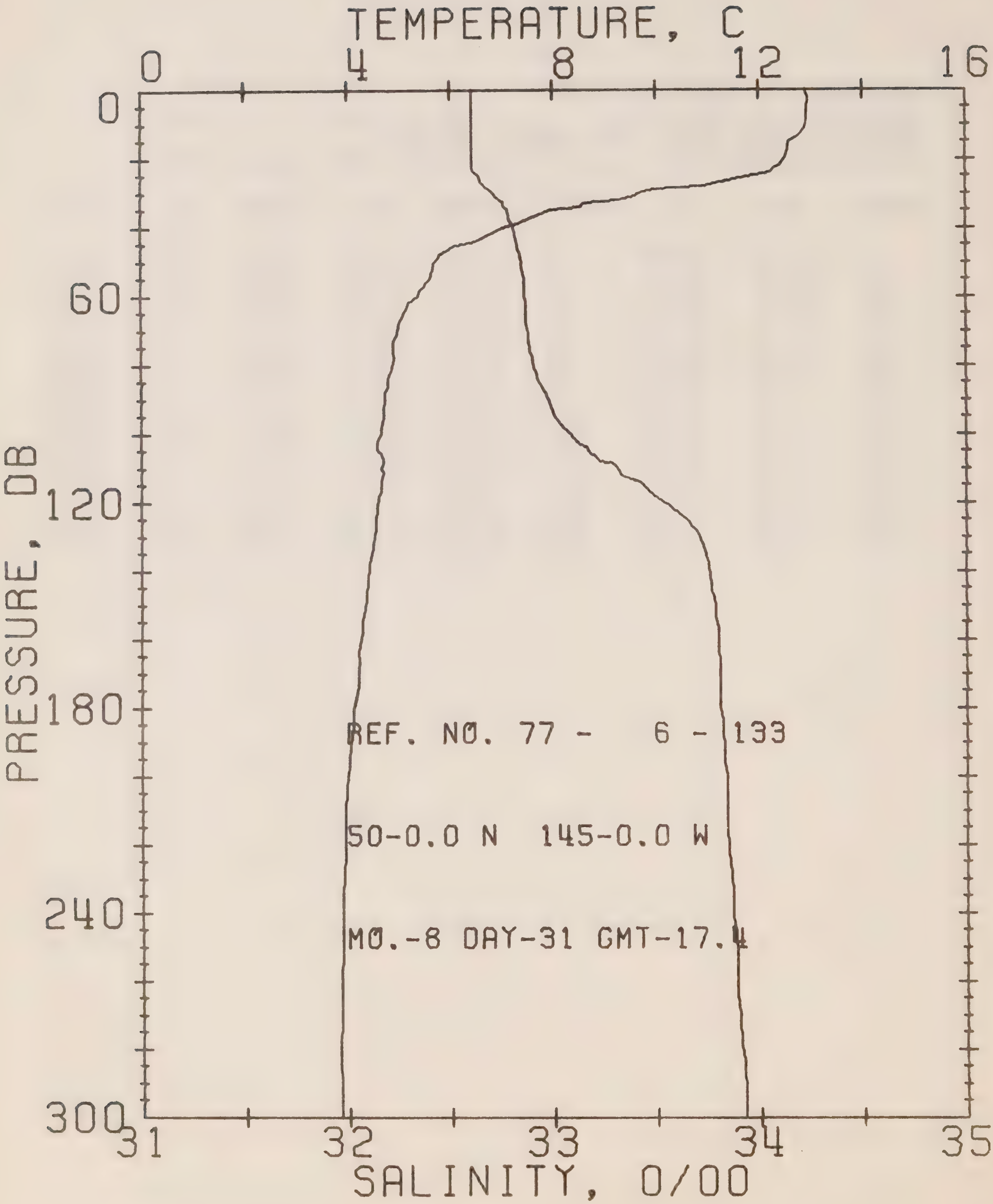
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.56	32.61	0	24.65	329.8	0.0	0.0	1496.
10	12.56	32.61	10	24.65	330.4	0.33	0.02	1497.
20	12.50	32.60	20	24.66	329.8	0.66	0.07	1496.
30	10.61	32.70	30	25.08	290.1	0.98	0.15	1490.
50	5.76	32.84	50	25.90	211.8	1.45	0.34	1472.
75	4.97	32.88	75	26.02	200.2	1.96	0.66	1469.
100	4.61	33.03	99	26.18	185.4	2.45	1.10	1468.
125	4.68	33.51	124	26.56	150.0	2.87	1.58	1470.
150	4.51	33.73	149	26.75	131.9	3.22	2.06	1470.
175	4.31	33.80	174	26.82	125.1	3.54	2.59	1469.
200	4.13	33.82	199	26.86	121.9	3.85	3.18	1469.
225	3.93	33.84	223	26.90	118.6	4.15	3.83	1469.
250	3.89	33.87	248	26.92	116.3	4.44	4.54	1469.
300	3.82	33.93	298	26.98	111.3	5.01	6.14	1470.



TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NO. 77 - 6 - 127
50-0.0 N 145-0.0 W
MO.-8 DAY-30 GMT-23.8
31
32
33
34
35
SALINITY, 0/00

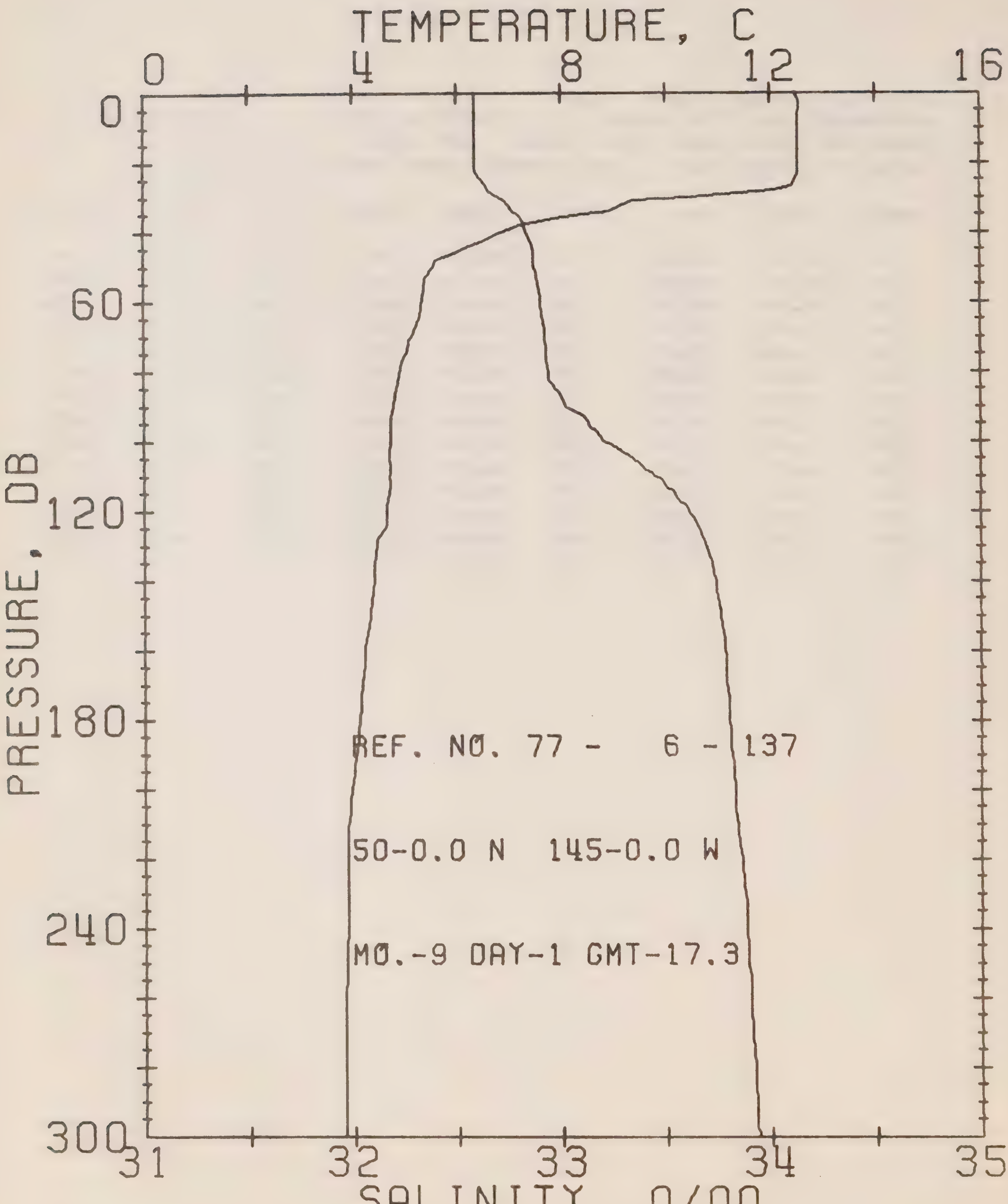
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-127 DATE 30/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 23.8
RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.16	32.60	0	24.53	341.7	0.0	0.0	1498.
10	12.90	32.60	10	24.58	337.3	0.34	0.02	1498.
20	12.39	32.61	20	24.69	327.3	0.67	0.07	1496.
30	8.14	32.78	30	25.54	246.4	0.96	0.14	1481.
50	5.53	32.86	50	25.94	207.6	1.40	0.32	1471.
75	4.86	32.89	75	26.05	198.0	1.91	0.64	1469.
100	4.58	33.04	99	26.19	184.3	2.39	1.07	1468.
125	4.70	33.38	124	26.45	160.2	2.82	1.56	1470.
150	4.54	33.65	149	26.68	138.5	3.19	2.08	1470.
175	4.32	33.77	174	26.80	127.3	3.52	2.63	1469.
200	4.11	33.81	199	26.85	122.6	3.83	3.22	1469.
225	3.96	33.84	223	26.90	118.7	4.13	3.88	1469.
250	3.88	33.86	248	26.92	117.0	4.43	4.59	1469.
300	3.85	33.91	298	26.96	113.2	5.00	6.20	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 133
50-0.0 N 145-0.0 W
MO.-8 DAY-31 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

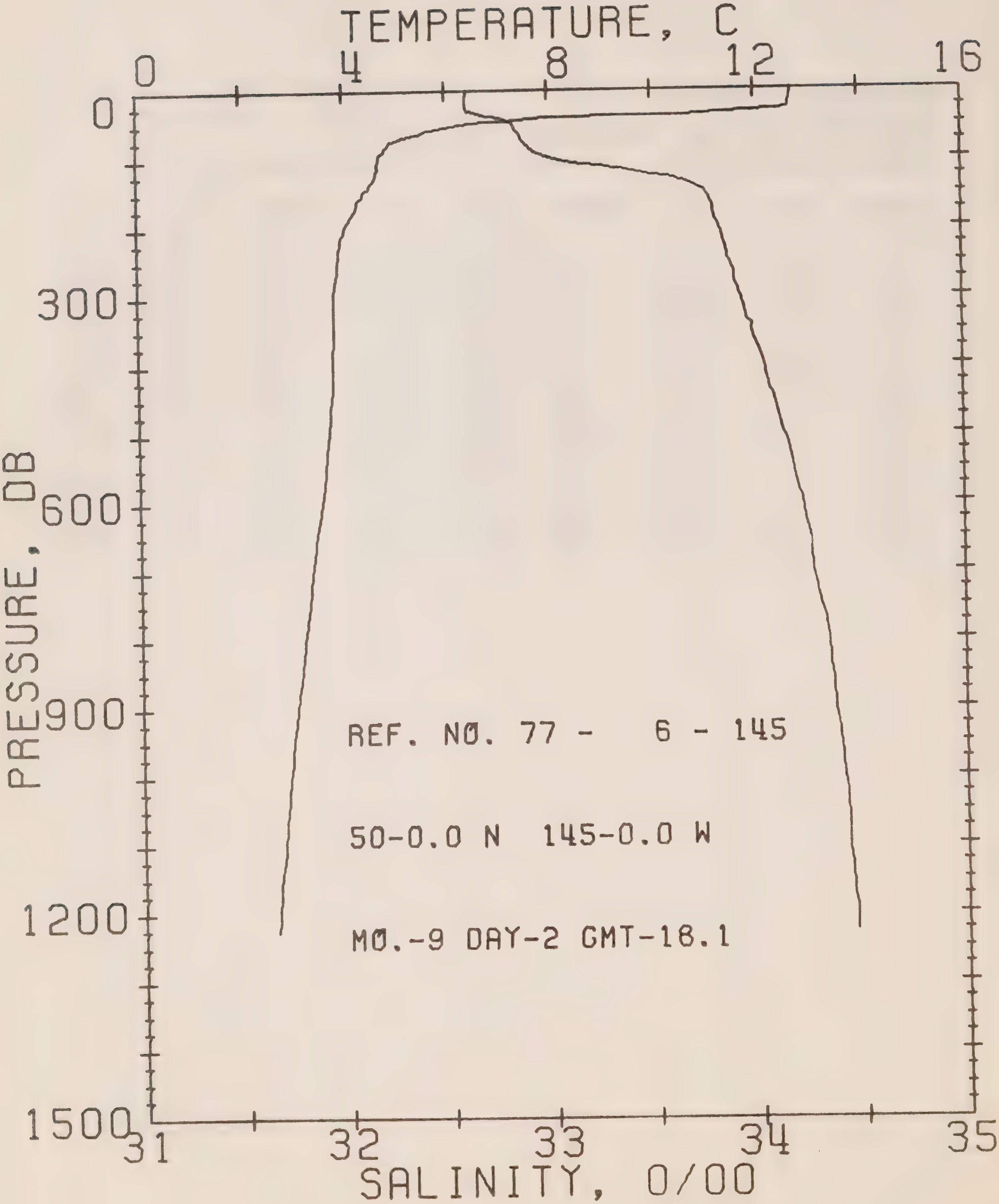
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-133 DATE 31/ 8/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 134 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.91	32.61	0	24.58	336.3	0.0	0.0	1498.
10	12.91	32.61	10	24.58	336.8	0.34	0.02	1498.
20	12.49	32.61	20	24.67	329.2	0.67	0.07	1496.
30	9.65	32.71	30	25.25	274.0	0.98	0.15	1487.
50	5.69	32.85	50	25.92	210.1	1.45	0.34	1472.
75	4.88	32.89	75	26.04	198.8	1.96	0.66	1469.
100	4.64	33.08	99	26.22	181.9	2.44	1.09	1469.
125	4.53	33.65	124	26.68	138.2	2.84	1.55	1469.
150	4.32	33.79	149	26.81	126.0	3.17	2.00	1469.
175	4.17	33.81	174	26.85	122.9	3.48	2.52	1469.
200	3.97	33.84	199	26.89	118.8	3.78	3.09	1468.
225	3.91	33.85	223	26.91	117.4	4.08	3.73	1469.
250	3.87	33.89	248	26.94	114.8	4.37	4.44	1469.
300	3.83	33.93	298	26.98	111.4	4.93	6.02	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 137
50-0.0 N 145-0.0 W
MØ.-9 DAY-1 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

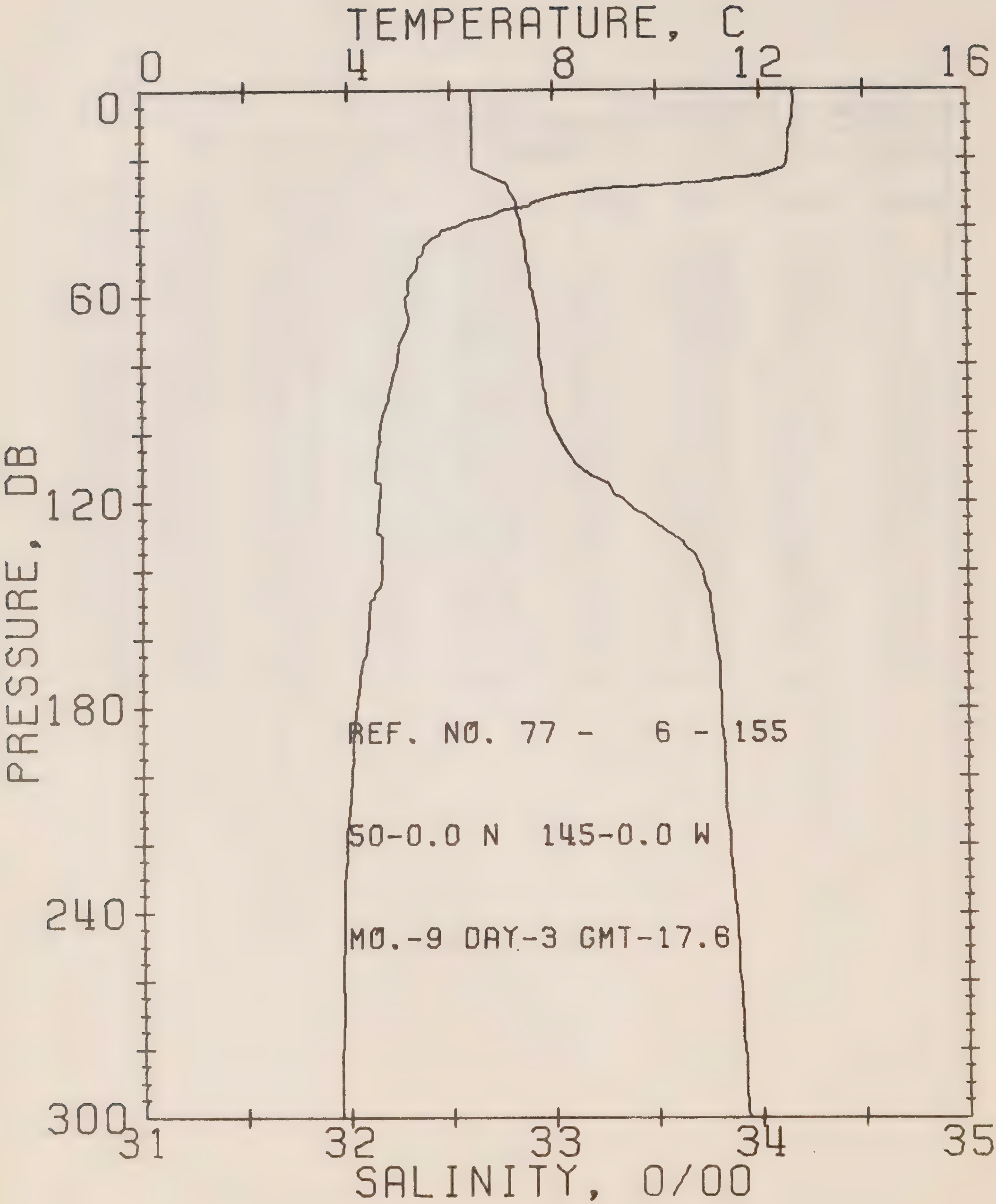
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-137   DATE 1/ 9/77   STATIUN P
POSITION 50- 0.0N, 145- 0.0W   GMT 17.3
RESULTS OF STP CAST   111 POINTS TAKEN FROM ANALOG TRAC=

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.47	32.59	0	24.65	329.7	0.0	0.0	1496.
10	12.54	32.59	10	24.64	331.3	0.33	0.02	1496.
20	12.52	32.59	20	24.64	331.2	0.66	0.07	1497.
30	10.46	32.70	30	25.10	287.6	0.99	0.15	1490.
50	5.51	32.87	50	25.96	206.7	1.45	0.34	1471.
75	5.00	32.93	75	26.06	196.8	1.95	0.66	1469.
100	4.73	33.20	99	26.30	173.8	2.42	1.07	1469.
125	4.59	33.66	124	26.68	138.1	2.80	1.51	1470.
150	4.32	33.76	149	26.79	128.0	3.13	1.97	1469.
175	4.14	33.80	174	26.84	123.3	3.45	2.49	1469.
200	3.96	33.83	199	26.89	119.4	3.75	3.07	1468.
225	3.88	33.87	223	26.92	116.2	4.05	3.71	1468.
250	3.83	33.89	248	26.95	114.1	4.33	4.40	1469.
300	3.81	33.94	298	26.99	110.5	4.89	5.98	1470.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 145
50-0.0 N 145-0.0 W
MØ.-9 DAY-2 GMT-18.1
31
32
33
34
35
SALINITY, 0/00

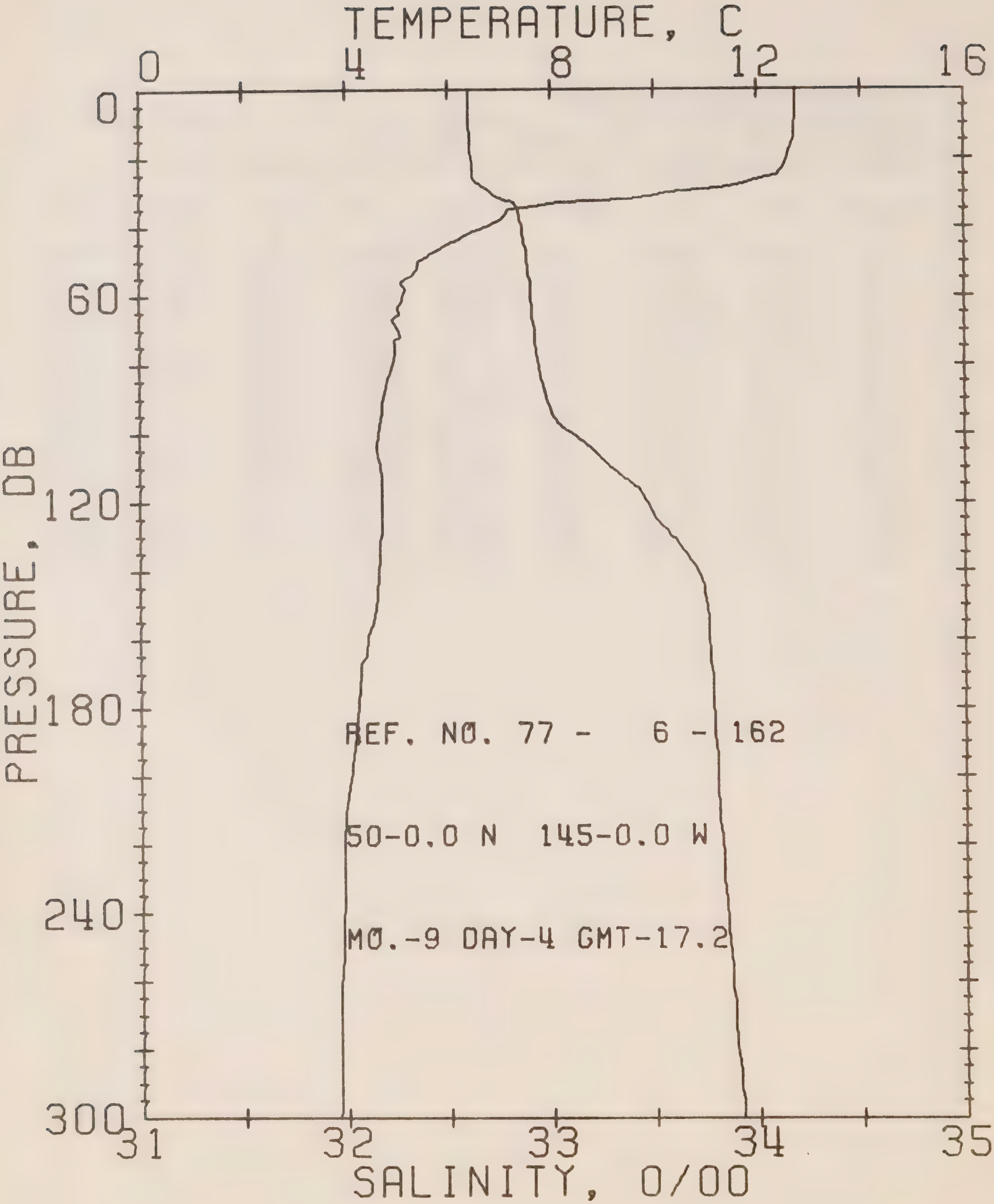
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-145 DATE 2/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 18.1
RESULTS OF STP CAST 176 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.72	32.61	0	24.62	332.7	0.0	0.0	1497.
10	12.69	32.60	10	24.62	333.1	0.33	0.02	1497.
20	12.67	32.60	20	24.62	333.2	0.67	0.07	1497.
30	12.45	32.61	30	24.67	328.7	1.00	0.15	1497.
50	6.28	32.83	50	25.83	218.6	1.53	0.37	1474.
75	4.92	32.88	75	26.03	199.7	2.06	0.70	1469.
100	4.69	33.02	99	26.17	187.0	2.54	1.13	1469.
125	4.61	33.53	124	26.58	148.3	2.96	1.61	1469.
150	4.38	33.76	149	26.78	128.7	3.30	2.08	1469.
175	4.21	33.80	174	26.84	124.0	3.62	2.61	1469.
200	3.99	33.83	199	26.88	119.8	3.92	3.19	1469.
225	3.92	33.85	223	26.91	117.5	4.22	3.83	1469.
250	3.88	33.87	248	26.93	115.7	4.51	4.54	1469.
300	3.80	33.93	298	26.98	111.1	5.08	6.13	1469.
400	3.76	34.04	397	27.07	103.2	6.15	9.96	1471.
500	3.68	34.13	496	27.16	96.2	7.15	14.53	1472.
600	3.52	34.22	595	27.24	88.8	8.08	19.72	1474.
800	3.15	34.34	793	27.37	77.5	9.74	31.56	1475.
1000	2.83	34.41	990	27.45	70.2	11.22	45.10	1477.
1200	2.59	34.46	1188	27.52	64.9	12.57	60.24	1480.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 155
50-0.0 N 145-0.0 W
MO.-9 DAY-3 GMT-17.6
31
32
33
34
35
SALINITY, 0/00

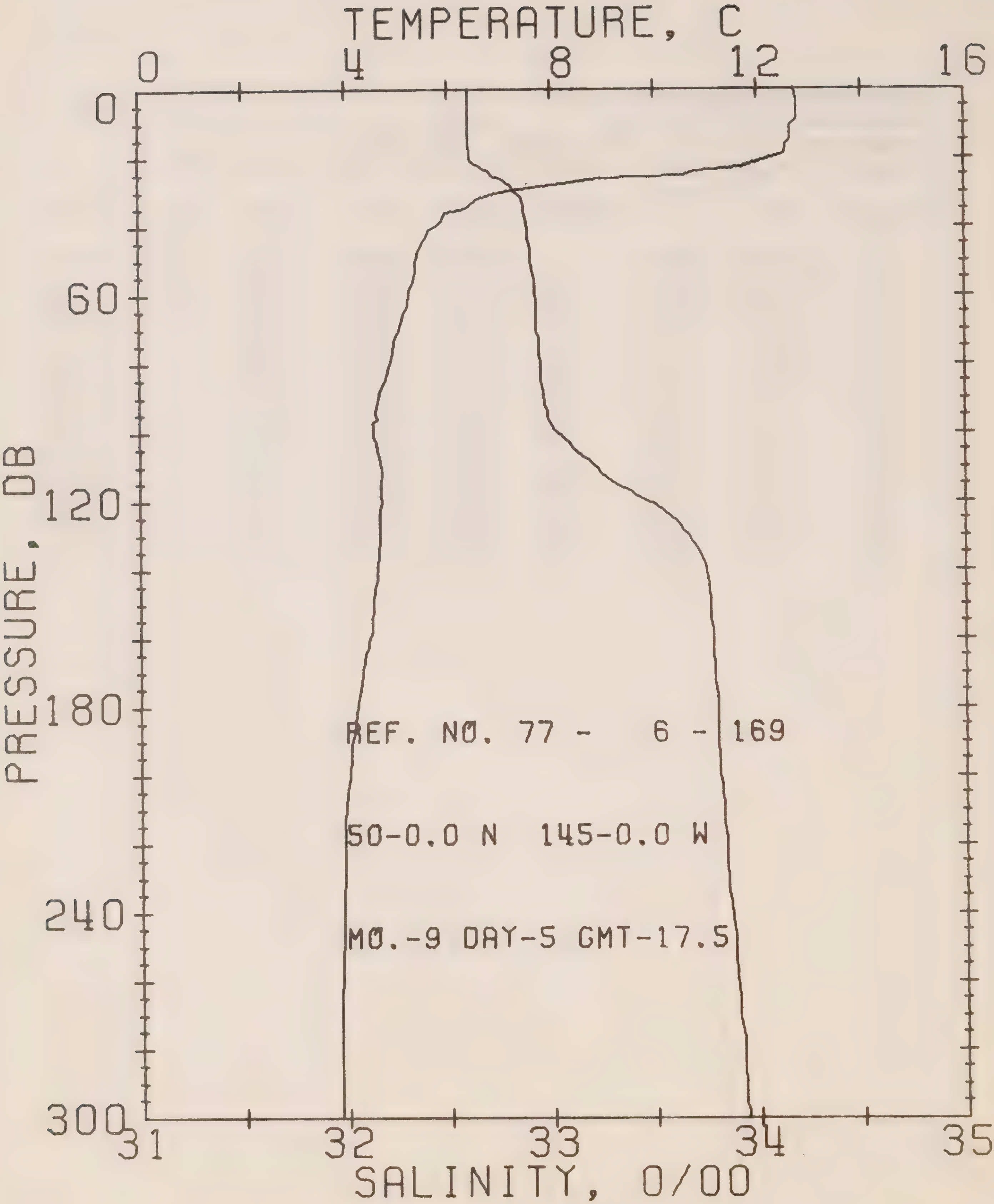
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-155 DATE 3/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.6
RESULTS OF STP CAST 119 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.65	32.60	0	24.63	332.2	0.0	0.0	1497.
10	12.62	32.61	10	24.64	331.4	0.33	0.02	1497.
20	12.54	32.61	20	24.66	330.2	0.66	0.07	1497.
30	8.48	32.79	30	25.49	250.6	0.97	0.14	1482.
50	5.36	32.87	50	25.97	204.9	1.40	0.32	1470.
75	4.98	32.93	75	26.06	196.6	1.90	0.64	1469.
100	4.58	33.01	99	26.17	186.5	2.39	1.07	1468.
125	4.56	33.47	124	26.54	152.0	2.82	1.56	1469.
150	4.40	33.75	149	26.78	129.3	3.16	2.04	1469.
175	4.16	33.80	174	26.84	123.3	3.48	2.56	1469.
200	4.02	33.83	199	26.88	120.1	3.78	3.14	1469.
225	3.90	33.85	223	26.91	117.4	4.08	3.79	1469.
250	3.86	33.89	248	26.94	114.4	4.37	4.49	1469.
300	3.81	33.94	298	26.99	110.5	4.93	6.07	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 162
50-0.0 N 145-0.0 W
MO.-9 DAY-4 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

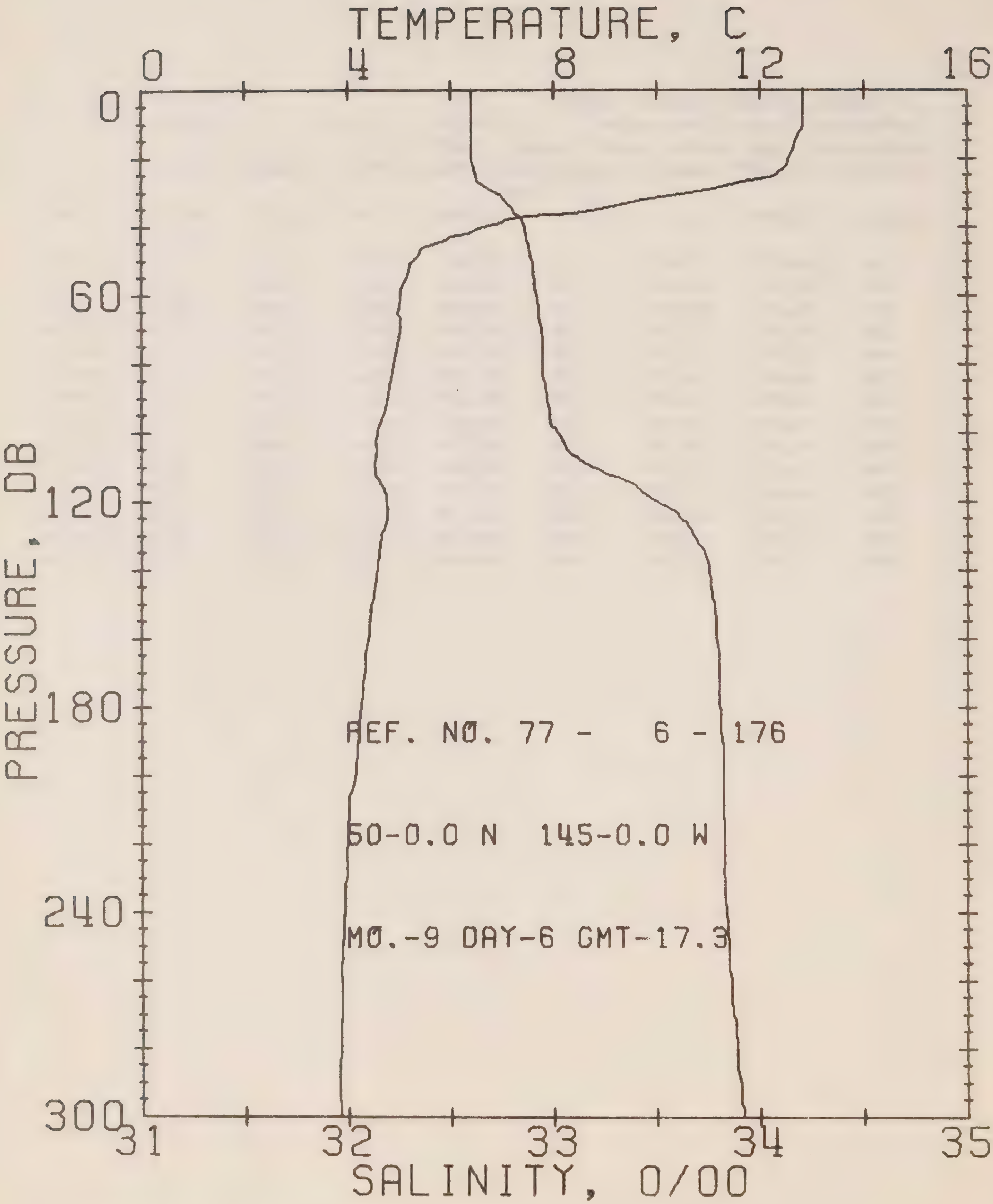
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-162 DATE 4/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.75	32.60	0	24.61	334.0	0.0	0.0	1497.
10	12.72	32.60	10	24.61	334.0	0.33	0.02	1497.
20	12.57	32.61	20	24.65	330.3	0.67	0.07	1497.
30	10.24	32.71	30	25.15	283.3	0.99	0.15	1489.
50	5.41	32.88	50	25.97	204.7	1.44	0.33	1471.
75	4.95	32.92	75	26.06	196.6	1.94	0.65	1469.
100	4.62	33.10	99	26.24	180.2	2.42	1.07	1469.
125	4.70	33.51	124	26.55	150.5	2.82	1.54	1470.
150	4.56	33.75	149	26.76	131.5	3.17	2.03	1470.
175	4.23	33.78	174	26.82	125.7	3.49	2.56	1469.
200	4.06	33.80	199	26.85	122.7	3.80	3.15	1469.
225	3.92	33.83	223	26.89	119.3	4.10	3.80	1469.
250	3.89	33.86	248	26.91	117.2	4.40	4.52	1469.
300	3.82	33.92	298	26.97	112.1	4.97	6.12	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 169
50-0.0 N 145-0.0 W
MØ.-9 DAY-5 GMT-17.5
31
32
33
34
35
SALINITY, 0/00

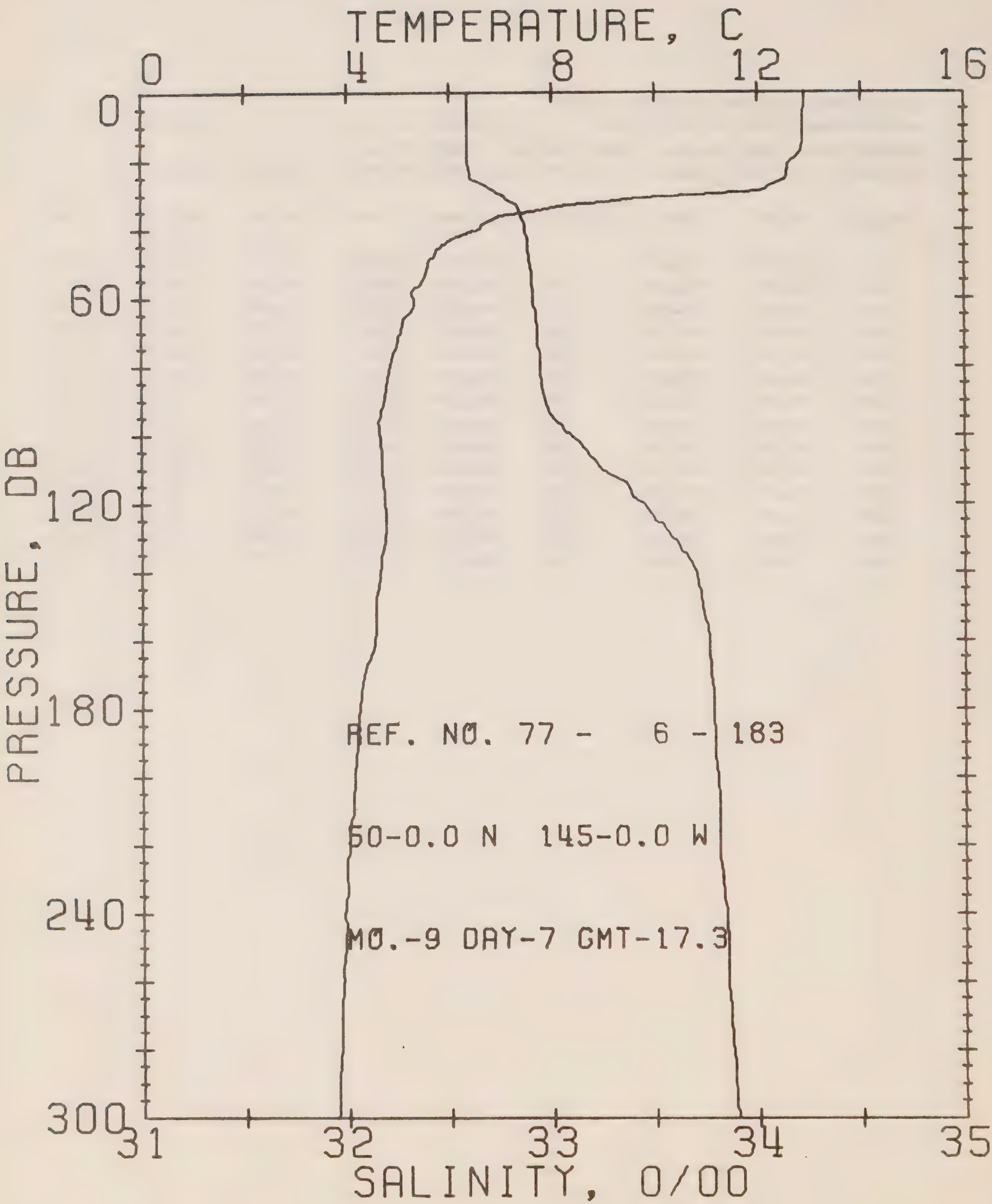
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-169 DATE 5/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.5
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.73	32.60	0	24.61	333.7	0.0	0.0	1497.
10	12.70	32.60	10	24.62	333.7	0.33	0.02	1497.
20	12.31	32.61	20	24.70	326.0	0.67	0.07	1496.
30	7.02	32.83	30	25.73	227.6	0.95	0.14	1477.
50	5.37	32.90	50	26.00	202.8	1.37	0.31	1471.
75	4.92	32.94	75	26.08	195.2	1.86	0.62	1469.
100	4.53	33.03	99	26.19	184.5	2.34	1.05	1468.
125	4.65	33.59	124	26.62	144.0	2.76	1.53	1470.
150	4.51	33.77	149	26.78	129.2	3.09	2.00	1470.
175	4.23	33.79	174	26.83	124.7	3.41	2.52	1469.
200	4.02	33.81	199	26.86	121.5	3.72	3.11	1469.
225	3.92	33.84	223	26.90	118.5	4.02	3.76	1469.
250	3.89	33.88	248	26.93	115.4	4.31	4.46	1469.
300	3.83	33.94	298	26.99	110.7	4.87	6.05	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 176
50-0.0 N 145-0.0 W
MO.-9 DAY-6 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

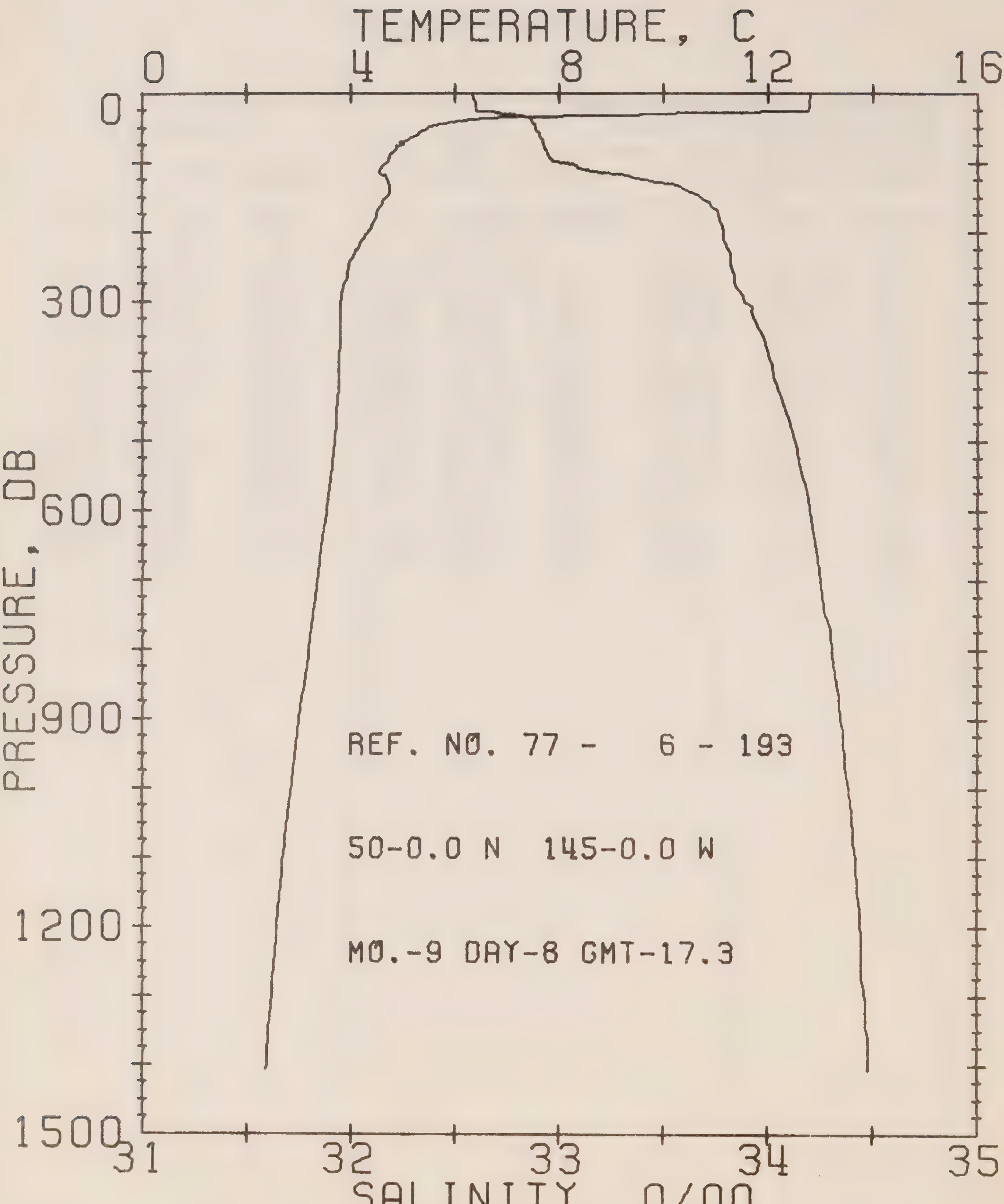
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-176 DATE 6/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 130 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.82	32.60	0	24.59	335.3	0.0	0.0	1497.
10	12.82	32.60	10	24.59	335.8	0.34	0.02	1497.
20	12.54	32.60	20	24.65	330.9	0.67	0.07	1497.
30	10.65	32.72	30	25.09	289.3	0.99	0.15	1490.
50	5.26	32.89	50	26.00	201.9	1.45	0.33	1470.
75	4.94	32.95	75	26.08	194.7	1.94	0.65	1469.
100	4.54	33.02	99	26.18	185.4	2.42	1.08	1468.
125	4.74	33.62	124	26.64	142.7	2.84	1.55	1470.
150	4.43	33.78	149	26.80	127.6	3.17	2.01	1469.
175	4.27	33.80	174	26.83	124.7	3.48	2.54	1469.
200	4.11	33.82	199	26.86	121.8	3.79	3.12	1469.
225	3.97	33.83	223	26.88	119.7	4.09	3.77	1469.
250	3.87	33.85	248	26.91	117.6	4.39	4.50	1469.
300	3.84	33.92	298	26.97	112.3	4.97	6.11	1470.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NØ. 77 - 6 - 183
50-0.0 N 145-0.0 W
MØ.-9 DAY-7 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-183 DATE 7/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.91	32.59	0	24.57	337.7	0.0	0.0	1498.
10	12.88	32.59	10	24.58	337.7	0.34	0.02	1498.
20	12.66	32.59	20	24.62	333.8	0.67	0.07	1497.
30	10.76	32.76	30	25.10	288.1	1.00	0.15	1491.
50	5.58	32.89	50	25.96	205.8	1.45	0.33	1471.
75	4.91	32.93	75	26.07	195.4	1.95	0.65	1469.
100	4.63	33.08	99	26.22	181.4	2.43	1.08	1469.
125	4.74	33.50	124	26.54	151.6	2.84	1.55	1470.
150	4.53	33.73	149	26.74	132.7	3.19	2.04	1470.
175	4.24	33.78	174	26.82	125.8	3.51	2.57	1469.
200	4.10	33.80	199	26.85	123.1	3.82	3.17	1469.
225	3.96	33.81	223	26.87	121.0	4.13	3.83	1469.
250	3.91	33.85	248	26.91	117.9	4.43	4.55	1469.
300	3.77	33.90	298	26.96	113.1	5.01	6.17	1469.


TEMPERATURE, C
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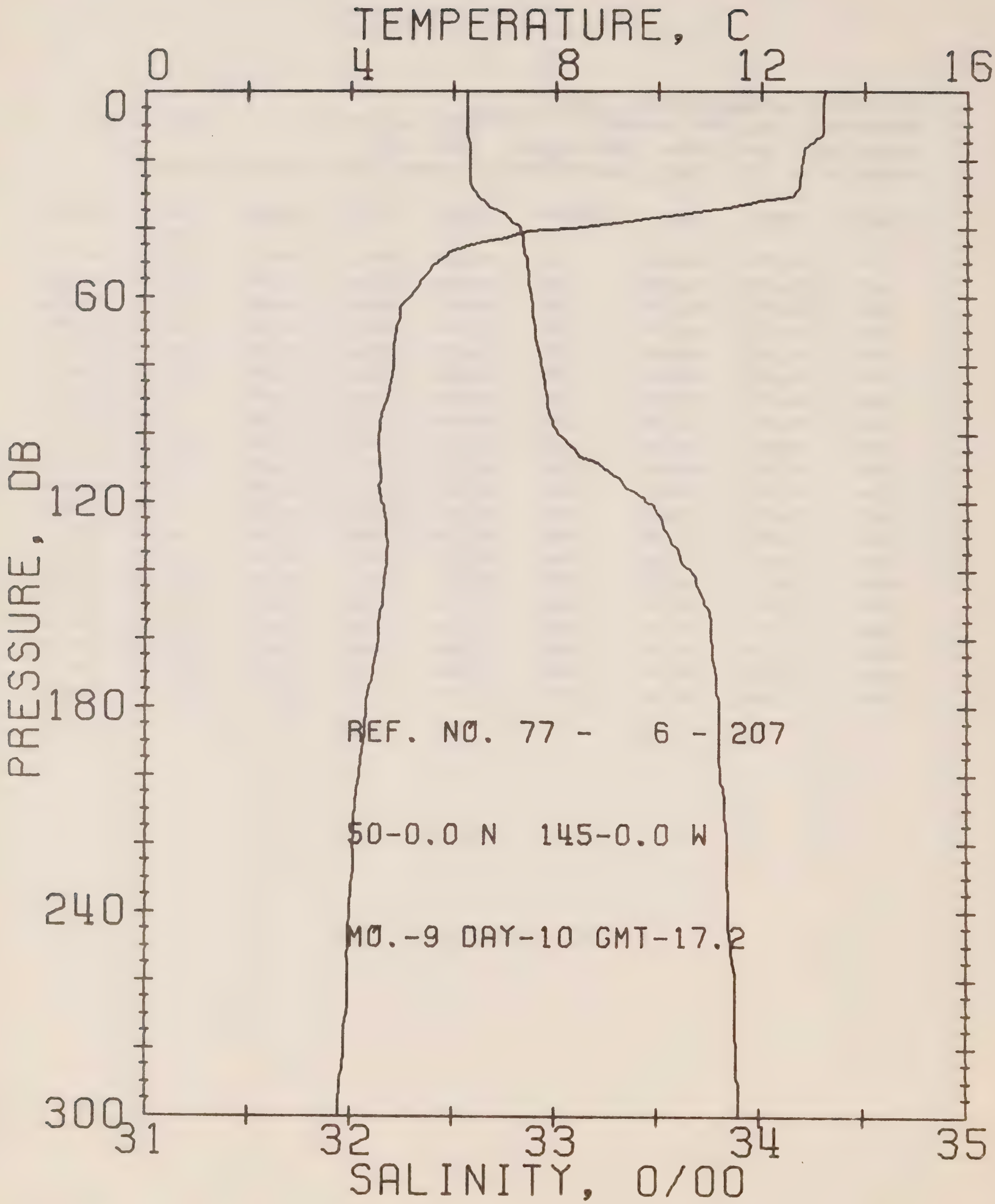
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 193
50-0.0 N 145-0.0 W
MØ.-9 DAY-8 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-193 DATE 8/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 189 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.79	32.59	0	24.59	335.5	0.0	0.0	1497.
10	12.77	32.59	10	24.60	335.6	0.34	0.02	1497.
20	12.78	32.60	20	24.60	335.3	0.67	0.07	1497.
30	10.13	32.73	30	25.18	280.1	0.99	0.15	1488.
50	5.46	32.89	50	25.98	204.6	1.44	0.33	1471.
75	4.95	32.92	75	26.06	196.6	1.94	0.65	1469.
100	4.67	33.00	99	26.15	188.3	2.43	1.08	1469.
125	4.72	33.42	124	26.48	157.2	2.86	1.57	1470.
150	4.67	33.68	149	26.69	138.0	3.22	2.08	1470.
175	4.47	33.76	174	26.78	129.8	3.56	2.63	1470.
200	4.31	33.79	199	26.82	126.1	3.88	3.25	1470.
225	4.10	33.81	223	26.85	122.6	4.19	3.92	1469.
250	3.94	33.82	248	26.88	120.5	4.49	4.65	1469.
300	3.80	33.89	298	26.95	114.2	5.08	6.30	1469.
400	3.77	34.02	397	27.06	104.5	6.16	10.16	1471.
500	3.67	34.13	496	27.15	96.3	7.17	14.77	1472.
600	3.51	34.20	595	27.22	90.3	8.10	19.99	1474.
800	3.18	34.31	793	27.34	80.1	9.81	32.13	1476.
1000	2.84	34.39	990	27.44	71.9	11.33	46.03	1477.
1200	2.56	34.44	1188	27.50	65.9	12.70	61.39	1480.


TEMPERATURE, C
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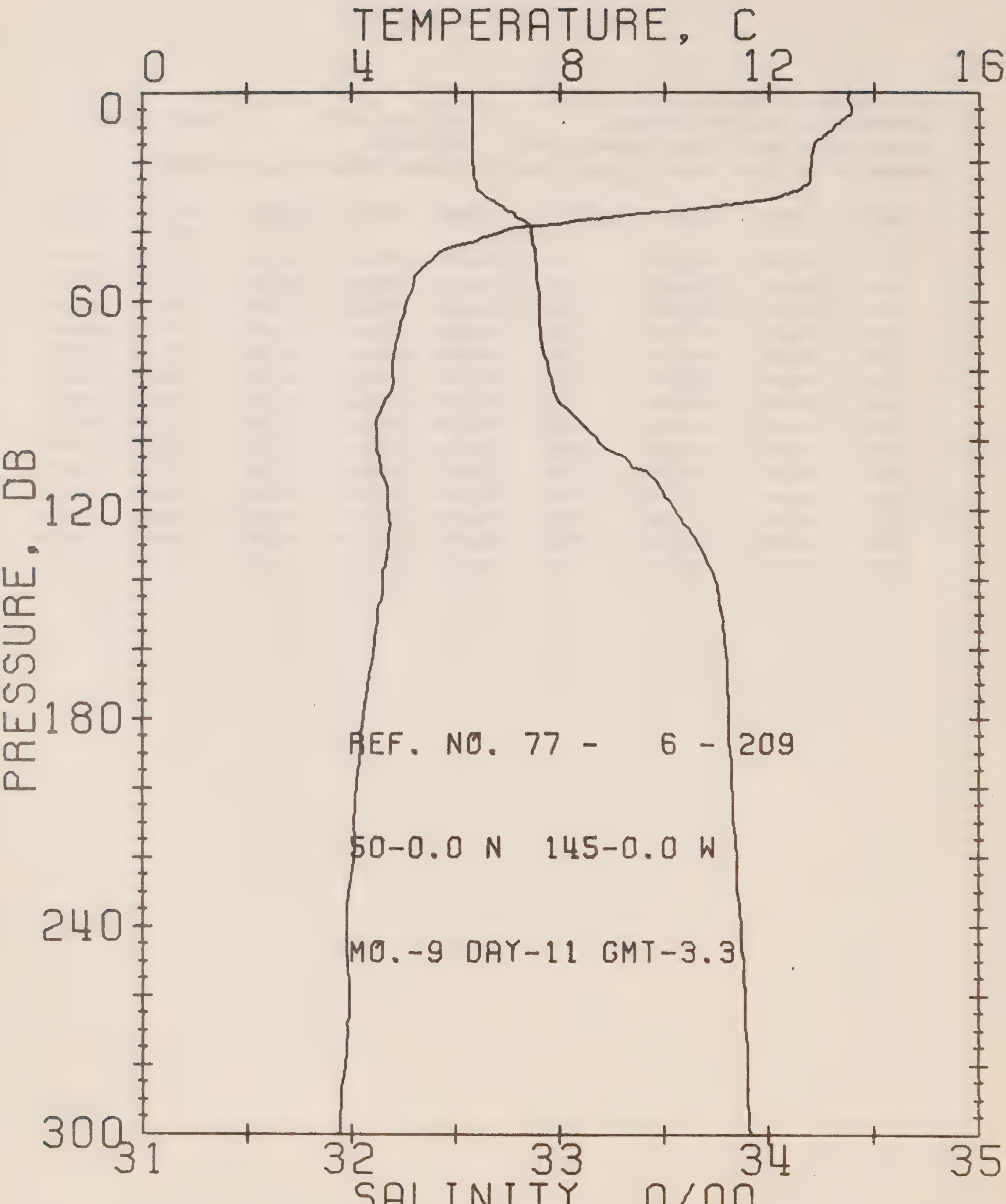
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 207
50-0.0 N 145-0.0 W
MO.-9 DAY-10 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

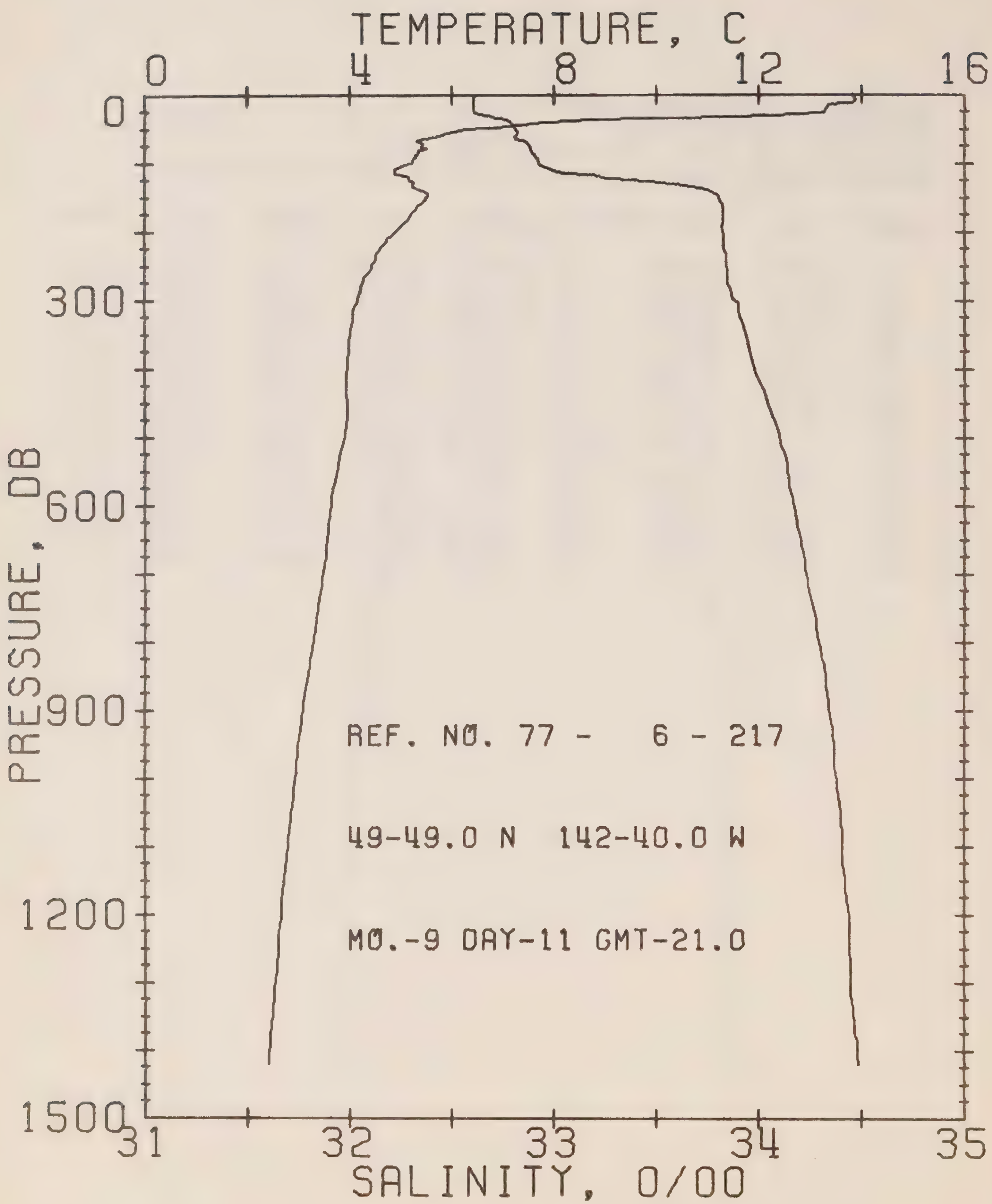
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-207 DATE 10/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 144 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.22	32.57	0	24.49	345.0	0.0	0.0	1499.
10	13.21	32.57	10	24.49	345.3	0.35	0.02	1499.
20	12.79	32.58	20	24.58	336.9	0.69	0.07	1497.
30	12.64	32.61	30	24.64	332.2	1.02	0.16	1497.
50	5.69	32.86	50	25.93	209.4	1.54	0.36	1472.
75	4.83	32.91	75	26.07	196.2	2.04	0.68	1469.
100	4.54	33.02	99	26.18	185.6	2.52	1.11	1468.
125	4.68	33.52	124	26.56	149.6	2.94	1.58	1470.
150	4.61	33.73	149	26.74	133.2	3.29	2.08	1470.
175	4.33	33.79	174	26.81	126.1	3.61	2.61	1469.
200	4.16	33.81	199	26.85	123.0	3.92	3.21	1469.
225	4.05	33.84	223	26.88	119.9	4.23	3.86	1469.
250	3.95	33.86	248	26.91	117.5	4.52	4.58	1469.
300	3.76	33.90	298	26.96	113.0	5.10	6.19	1469.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NØ. 77 - 6 - 209
50-0.0 N 145-0.0 W
MØ.-9 DAY-11 GMT-3.3
31
32
33
34
35
SALINITY, 0/00

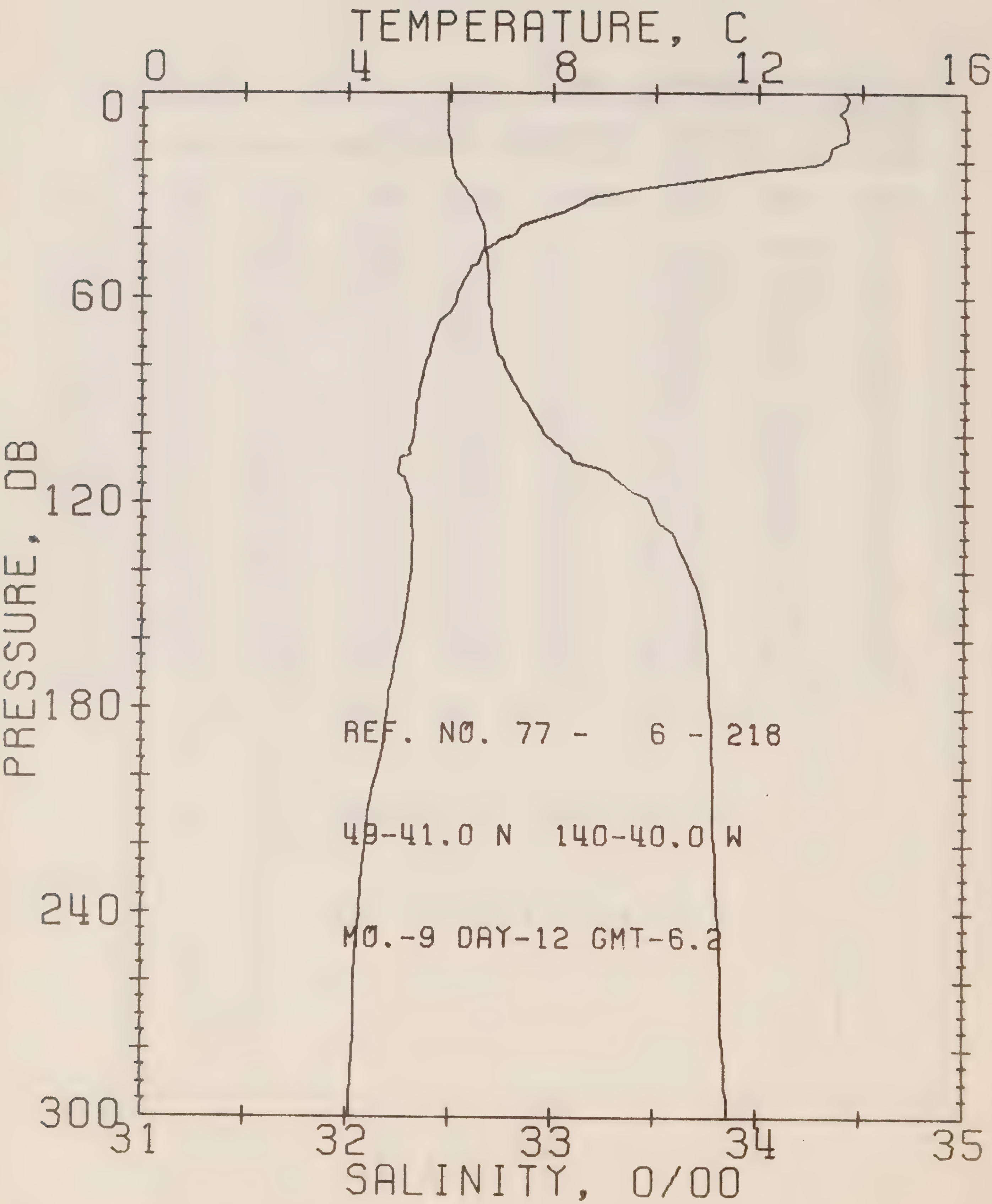
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-209 DATE 11/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 3.3
RESULTS OF STP CAST 127 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.52	32.58	0	24.44	350.0	0.0	0.0	1500.
10	13.22	32.58	10	24.50	344.8	0.35	0.02	1499.
20	12.80	32.58	20	24.59	336.9	0.69	0.07	1497.
30	12.19	32.64	30	24.75	321.7	1.02	0.15	1496.
50	5.39	32.89	50	25.98	203.7	1.51	0.35	1471.
75	4.80	32.92	75	26.08	195.4	2.00	0.66	1469.
100	4.49	33.18	99	26.31	172.8	2.47	1.08	1468.
125	4.73	33.61	124	26.63	143.3	2.86	1.52	1470.
150	4.49	33.77	149	26.79	128.7	3.20	1.99	1470.
175	4.26	33.81	174	26.84	124.0	3.51	2.52	1469.
200	4.08	33.82	199	26.87	121.1	3.82	3.10	1469.
225	3.97	33.85	223	26.90	118.3	4.12	3.75	1469.
250	3.93	33.88	248	26.93	115.9	4.41	4.46	1469.
300	3.77	33.92	298	26.98	111.6	4.98	6.06	1469.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 217
49-49.0 N 142-40.0 W
MØ.-9 DAY-11 GMT-21.0
31
32
33
34
35
SALINITY, 0/00

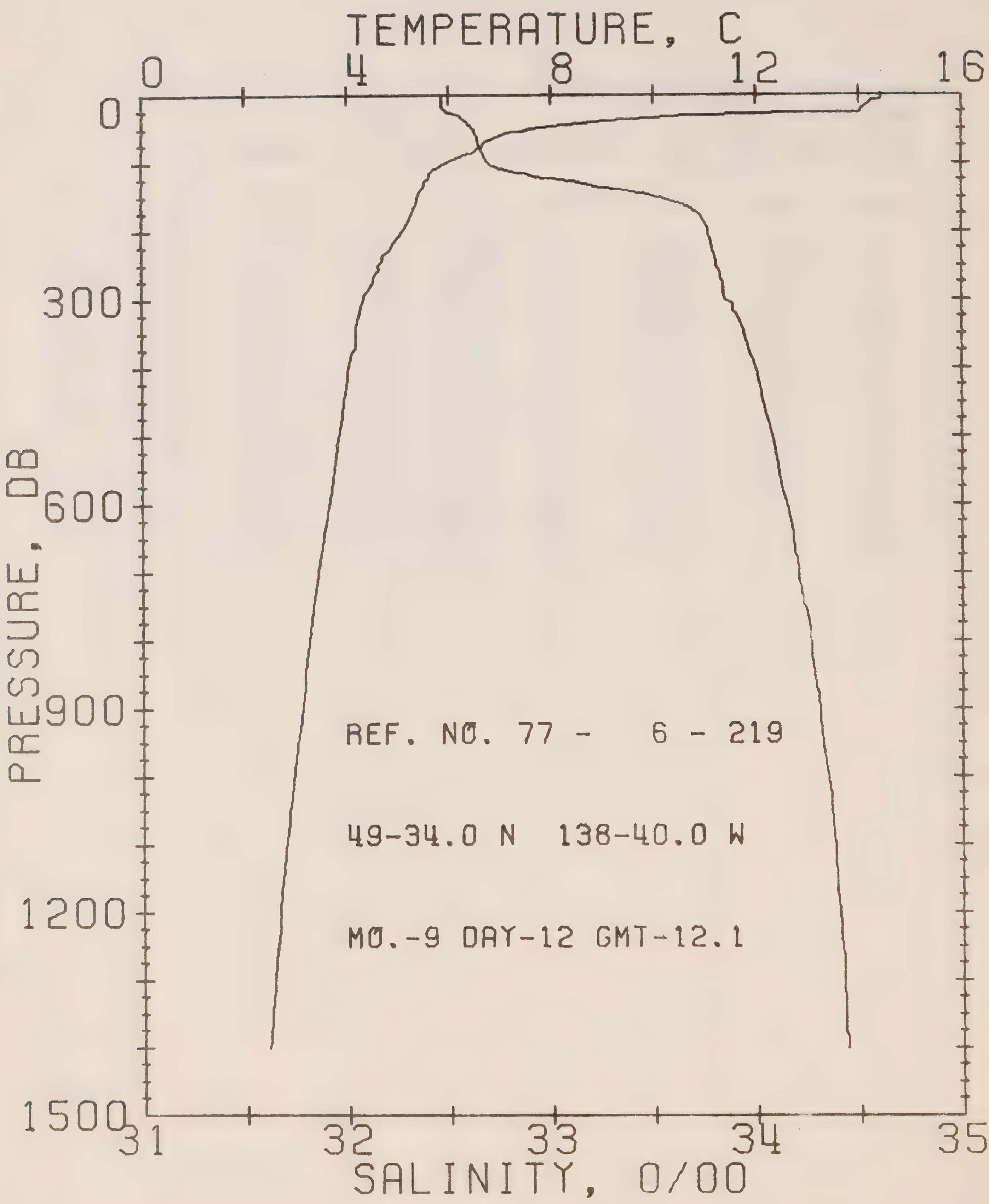
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-217 DATE 11/ 9/77 STATION 12
POSITION 49-49.0N, 142-40.0W GMT 21.0
RESULTS OF STP CAST 229 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.84	32.61	0	24.40	354.0	0.0	0.0	1501.
10	13.83	32.61	10	24.40	354.3	0.35	0.02	1501.
20	13.29	32.61	20	24.51	344.2	0.70	0.07	1499.
30	12.50	32.65	30	24.70	326.4	1.04	0.16	1497.
50	6.44	32.81	50	25.79	222.1	1.55	0.36	1475.
75	5.40	32.88	75	25.98	204.9	2.08	0.70	1471.
100	5.16	32.92	99	26.04	199.1	2.59	1.15	1471.
125	5.17	33.41	124	26.42	162.8	3.05	1.68	1472.
150	5.50	33.80	149	26.69	138.0	3.41	2.19	1474.
175	5.19	33.83	174	26.75	132.5	3.75	2.74	1473.
200	4.89	33.82	199	26.78	129.8	4.08	3.37	1472.
225	4.57	33.83	223	26.82	126.1	4.40	4.06	1471.
250	4.42	33.84	248	26.84	124.0	4.71	4.82	1471.
300	4.13	33.88	298	26.91	118.3	5.32	6.52	1471.
400	3.93	33.98	397	27.01	109.5	6.45	10.55	1472.
500	3.88	34.10	496	27.11	100.7	7.50	15.37	1473.
600	3.63	34.17	595	27.19	93.6	8.47	20.79	1474.
800	3.26	34.29	793	27.32	82.1	10.23	33.28	1476.
1000	2.91	34.38	990	27.42	73.3	11.77	47.37	1478.
1200	2.63	34.44	1188	27.49	67.0	13.17	63.06	1480.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
31
32
33
34
35
SALINITY, 0/00
REF. NO. 77 - 6 - 218
49-41.0 N 140-40.0 W
MO.-9 DAY-12 GMT-6.2

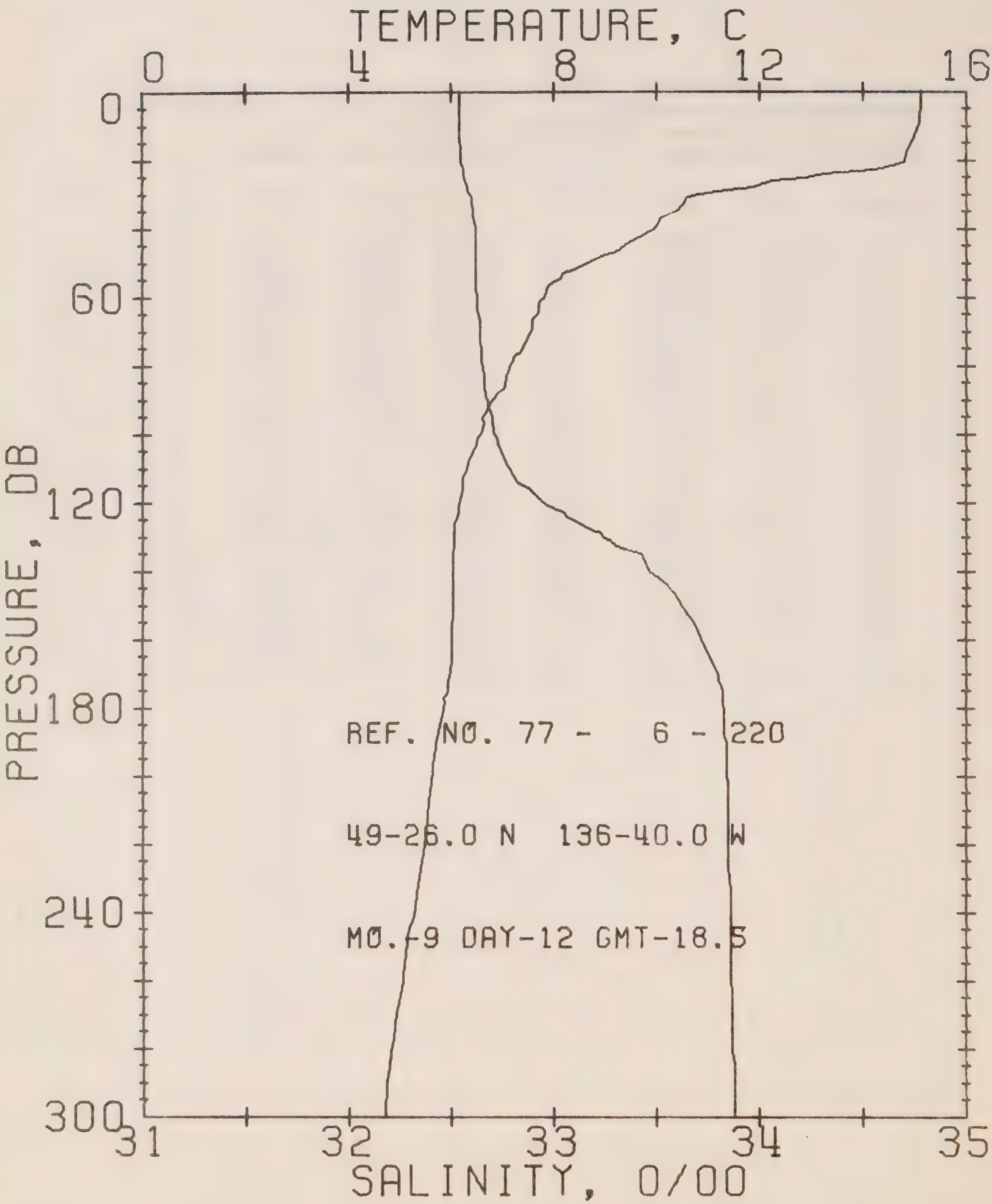
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-218 DATE 12/ 9/77 STATION 11
POSITION 49-41.0N, 140-40.0W GMT 6.2
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.66	32.49	0	24.34	359.3	0.0	0.0	1500.
10	13.72	32.49	10	24.33	360.9	0.36	0.02	1500.
20	13.28	32.50	20	24.43	351.6	0.72	0.07	1499.
30	9.01	32.59	30	25.26	273.1	1.03	0.15	1484.
50	6.53	32.68	50	25.68	232.9	1.52	0.35	1475.
75	5.61	32.73	75	25.83	218.5	2.09	0.71	1472.
100	5.28	32.96	99	26.05	197.8	2.61	1.17	1471.
125	5.26	33.51	124	26.49	156.7	3.04	1.67	1472.
150	5.15	33.73	149	26.68	139.2	3.41	2.18	1472.
175	4.81	33.77	174	26.75	132.7	3.75	2.74	1471.
200	4.56	33.79	199	26.79	128.7	4.08	3.37	1471.
225	4.31	33.80	223	26.83	125.5	4.39	4.06	1470.
250	4.16	33.82	248	26.86	122.7	4.71	4.81	1470.
300	4.04	33.86	298	26.90	118.9	5.31	6.51	1470.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 219
49-34.0 N 138-40.0 W
MO.-9 DAY-12 GMT-12.1
31
32
33
34
35
SALINITY, 0/00

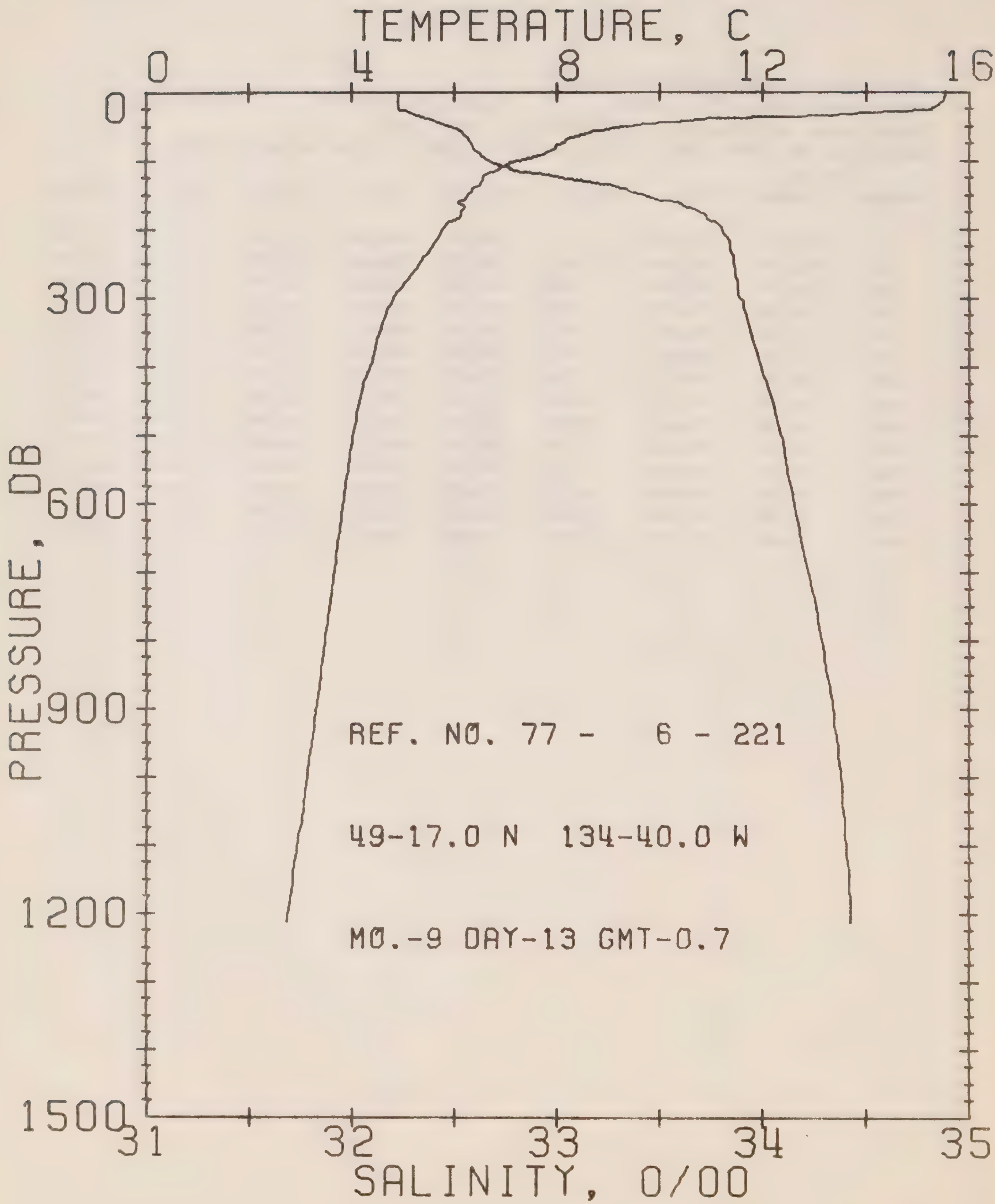
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-219 DATE 12/ 9/77 STATION 10
POSITION 49-34.0N, 138-40.0W GMT 12.1
RESULTS OF STP CAST 181 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.42	32.47	0	24.17	375.7	0.0	0.0	1502.
10	14.22	32.47	10	24.21	372.2	0.38	0.02	1502.
20	14.07	32.47	20	24.24	369.5	0.75	0.08	1502.
30	10.80	32.55	30	24.93	304.3	1.10	0.16	1491.
50	7.68	32.61	50	25.47	252.7	1.65	0.39	1479.
75	6.64	32.65	75	25.64	237.2	2.25	0.77	1476.
100	5.95	32.69	99	25.76	225.6	2.83	1.29	1473.
125	5.56	33.06	124	26.10	194.1	3.36	1.90	1473.
150	5.37	33.52	149	26.48	157.7	3.80	2.51	1473.
175	5.24	33.72	174	26.66	141.2	4.17	3.12	1473.
200	5.07	33.77	199	26.72	136.0	4.52	3.78	1473.
225	4.84	33.79	223	26.76	132.0	4.85	4.51	1472.
250	4.60	33.81	248	26.80	128.2	5.18	5.30	1472.
300	4.31	33.85	298	26.86	122.5	5.81	7.05	1472.
400	4.01	34.00	397	27.01	109.2	6.95	11.14	1472.
500	3.83	34.08	496	27.10	102.0	8.01	15.98	1473.
600	3.63	34.15	595	27.17	95.4	9.00	21.51	1474.
800	3.22	34.26	793	27.30	83.9	10.79	34.23	1476.
1000	2.92	34.35	990	27.40	75.8	12.39	48.90	1478.
1200	2.65	34.40	1188	27.46	70.1	13.84	65.15	1480.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 220
49-26.0 N 136-40.0 W
MO.-9 DAY-12 GMT-18.5
31
32
33
34
35
SALINITY, 0/00

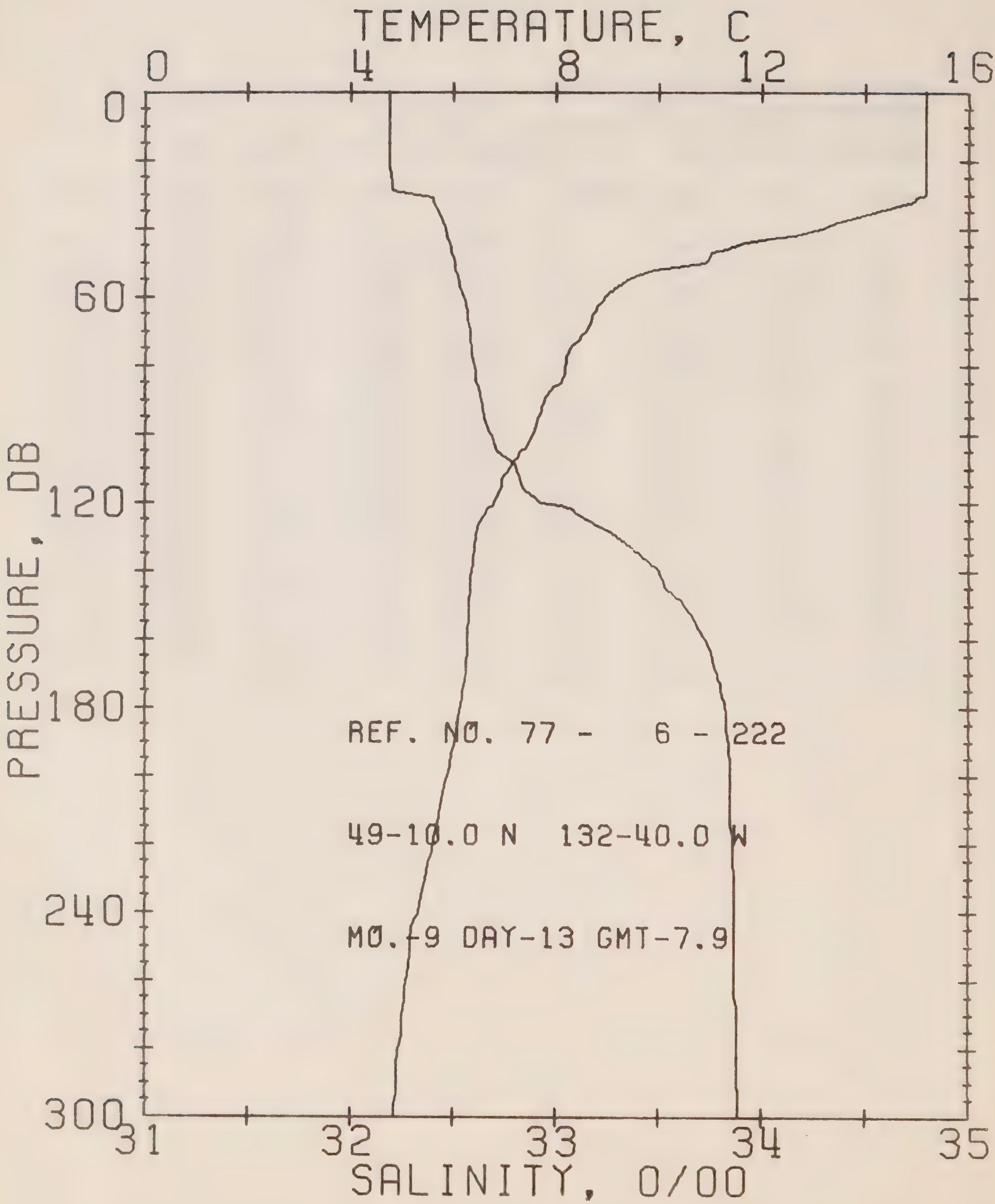
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-220 DATE 12/ 9/77 STATION 9
POSITION 49-26.0N, 136-40.0W GMT 18.5
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.12	32.54	0	24.08	384.8	0.0	0.0	1505.
10	15.06	32.54	10	24.09	384.1	0.38	0.02	1505.
20	14.79	32.55	20	24.15	378.0	0.77	0.08	1504.
30	10.83	32.59	30	24.95	301.9	1.11	0.16	1491.
50	8.66	32.62	50	25.33	266.1	1.68	0.40	1483.
75	7.37	32.65	75	25.54	246.4	2.31	0.30	1479.
100	6.56	32.71	99	25.70	231.7	2.91	1.33	1476.
125	6.08	33.09	124	26.06	197.3	3.45	1.95	1475.
150	6.02	33.62	149	26.49	157.7	3.89	2.56	1476.
175	5.91	33.82	174	26.66	141.7	4.26	3.18	1476.
200	5.61	33.84	199	26.71	136.6	4.61	3.34	1475.
225	5.40	33.85	223	26.74	134.0	4.94	4.57	1475.
250	5.10	33.86	248	26.79	130.0	5.27	5.37	1474.
300	4.68	33.88	298	26.85	124.3	5.91	7.15	1473.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 6 - 221
49-17.0 N 134-40.0 W
MO.-9 DAY-13 GMT-0.7
31
32
33
34
35
SALINITY, 0/00

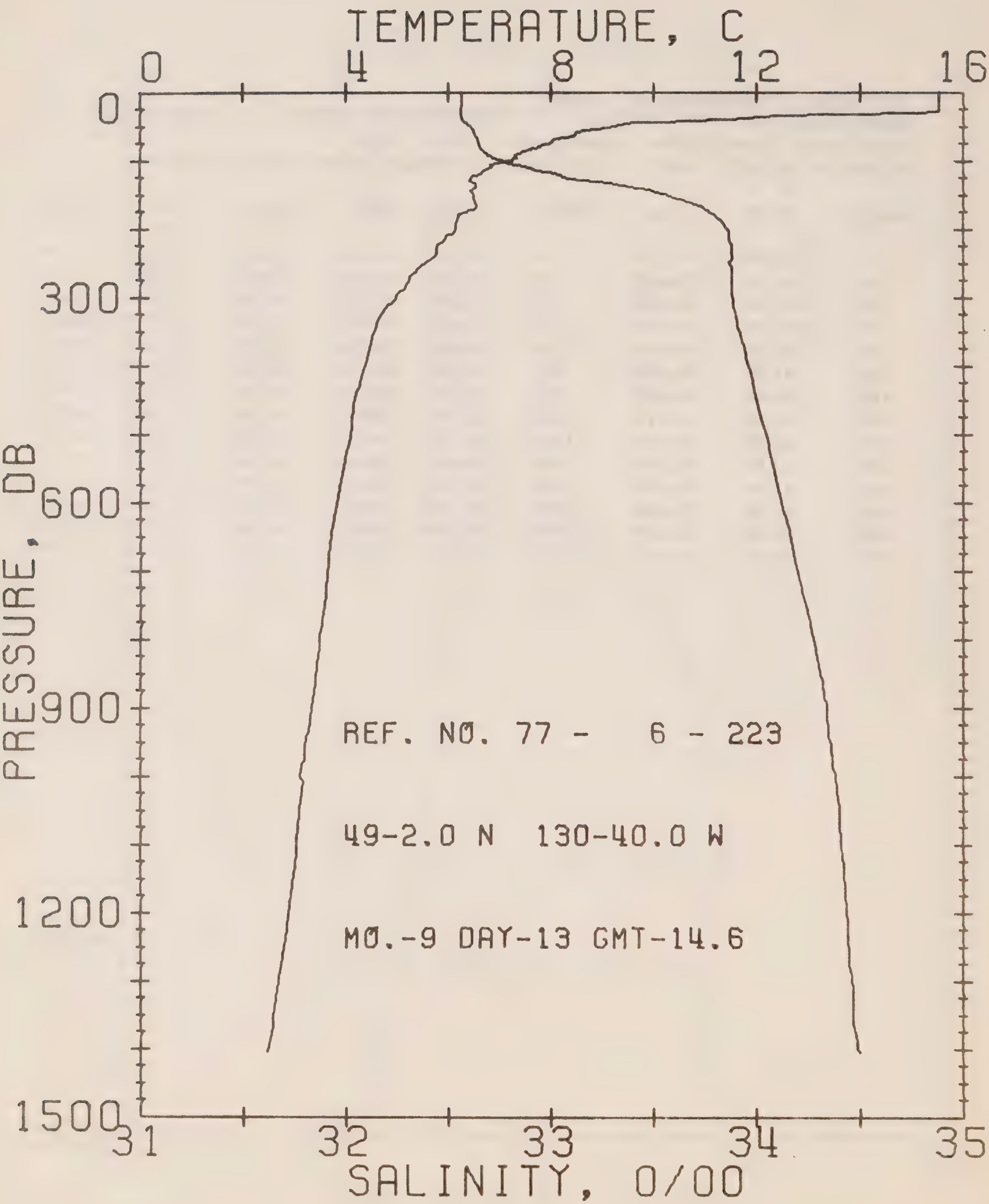
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-221 DATE 13/ 9/77 STATION 8
POSITION 49-17.0N, 134-40.0W GMT 0.7
RESULTS OF STP CAST 190 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.53	32.22	0	23.74	416.8	0.0	0.0	1506.
10	15.50	32.23	10	23.75	415.9	0.42	0.02	1506.
20	15.39	32.23	20	23.78	413.9	0.83	0.08	1506.
30	14.32	32.28	30	24.04	388.7	1.24	0.19	1502.
50	9.37	32.49	50	25.12	286.3	1.89	0.45	1486.
75	8.03	32.58	75	25.40	260.4	2.57	0.88	1481.
100	7.29	32.67	99	25.57	244.1	3.21	1.45	1479.
125	6.56	33.02	124	25.94	208.9	3.78	2.10	1477.
150	6.25	33.42	149	26.30	175.4	4.25	2.76	1476.
175	6.13	33.70	174	26.53	153.7	4.66	3.44	1477.
200	5.76	33.80	199	26.66	141.7	5.03	4.14	1476.
225	5.55	33.84	224	26.72	136.5	5.38	4.89	1475.
250	5.31	33.86	248	26.76	132.5	5.71	5.71	1475.
300	4.80	33.89	298	26.84	124.8	6.36	7.51	1474.
400	4.34	33.99	397	26.97	113.3	7.54	11.73	1473.
500	4.01	34.09	496	27.09	103.1	8.62	16.65	1474.
600	3.83	34.15	595	27.16	97.2	9.62	22.25	1475.
800	3.47	34.29	793	27.30	84.9	11.43	35.18	1477.
1000	3.11	34.38	991	27.41	75.4	13.03	49.77	1479.
1200	2.73	34.43	1188	27.48	68.7	14.47	65.88	1480.


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 6 - 222
49-10.0 N 132-40.0 W
MO.-9 DAY-13 GMT-7.9
31
32
33
34
35
SALINITY, 0/00

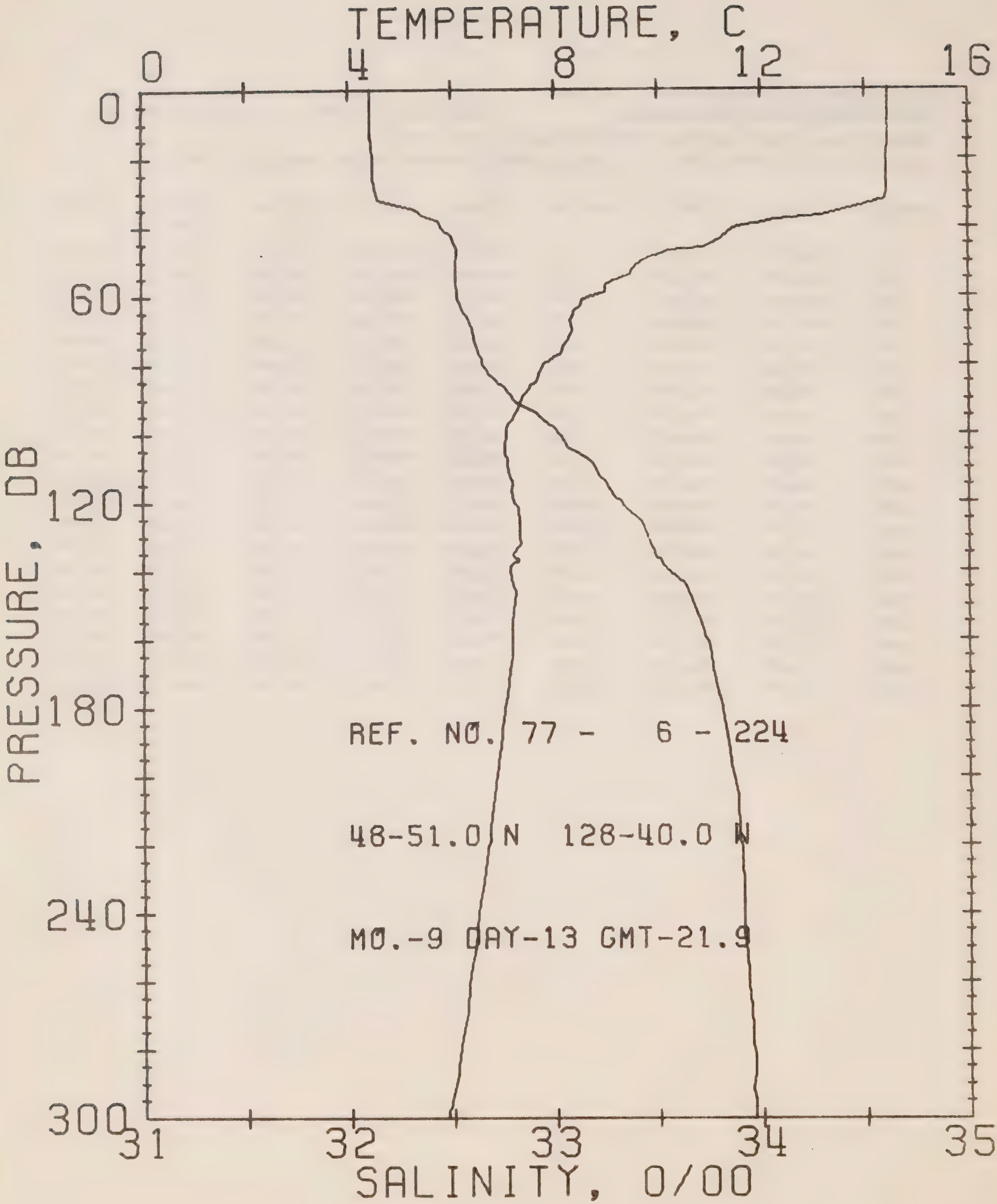
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-222 DATE 13/ 9/77 STATION 7
POSITION 49-10.0N, 132-40.0W GMT 7.9
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.16	32.19	0	23.80	411.2	0.0	0.0	1504.
10	15.16	32.19	10	23.80	411.7	0.41	0.02	1505.
20	15.18	32.19	20	23.79	412.4	0.82	0.08	1505.
30	15.18	32.32	30	23.89	403.1	1.24	0.19	1505.
50	10.89	32.51	50	24.88	309.2	1.94	0.47	1491.
75	8.25	32.59	75	25.37	262.8	2.63	0.91	1482.
100	7.52	32.68	99	25.55	246.4	3.27	1.48	1480.
125	6.52	33.15	124	26.05	198.6	3.84	2.13	1477.
150	6.30	33.62	149	26.45	161.1	4.28	2.75	1477.
175	6.17	33.80	174	26.61	146.4	4.66	3.38	1477.
200	5.86	33.85	199	26.69	139.2	5.01	4.06	1476.
225	5.50	33.86	224	26.74	134.3	5.36	4.80	1475.
250	5.15	33.87	248	26.79	129.8	5.69	5.60	1474.
300	4.83	33.89	298	26.84	125.2	6.32	7.38	1474.


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 6 - 223
49-2.0 N 130-40.0 W
MØ.-9 DAY-13 GMT-14.6
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-223 DATE 13/ 9/77 STATION 6
POSITION 49- 2.0N, 130-40.0W GMT 14.6
RESULTS OF STP CAST 223 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	15.53	32.56	0	24.00	391.8	0.0	0.0	1506.
10	15.53	32.57	10	24.01	391.6	0.39	0.02	1506.
20	15.53	32.57	20	24.01	391.9	0.78	0.08	1506.
30	15.19	32.56	30	24.07	385.9	1.18	0.18	1506.
50	9.28	32.60	50	25.22	276.6	1.81	0.43	1485.
75	7.92	32.65	75	25.47	253.7	2.46	0.85	1481.
100	7.24	32.75	99	25.64	237.1	3.08	1.40	1479.
125	6.44	33.09	124	26.01	202.1	3.62	2.02	1476.
150	6.49	33.57	149	26.39	167.2	4.08	2.66	1478.
175	6.35	33.77	174	26.56	150.9	4.48	3.32	1478.
200	6.12	33.85	199	26.66	142.1	4.84	4.02	1477.
225	5.77	33.88	224	26.72	136.2	5.19	4.77	1476.
250	5.55	33.87	248	26.74	134.5	5.53	5.59	1476.
300	4.96	33.88	298	26.82	127.5	6.18	7.42	1474.
400	4.36	33.96	397	26.95	115.7	7.39	11.71	1474.
500	4.08	34.05	496	27.05	106.9	8.50	16.81	1474.
600	3.81	34.12	595	27.13	99.6	9.53	22.59	1475.
800	3.47	34.28	793	27.29	85.7	11.38	35.74	1477.
1000	3.09	34.38	991	27.41	75.1	12.99	50.43	1479.
1200	2.87	34.44	1188	27.47	69.8	14.44	66.71	1481.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NØ. 77 - 6 - 224
48-51.0 N 128-40.0 W
MØ.-9 DAY-13 GMT-21.9
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 6-224 DATE 13/ 9/77 STATION 5
POSITION 48-51.0N, 128-40.0W GMT 21.9
RESULTS OF STP CAST 118 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.45	32.11	0	23.89	402.7	0.0	0.0	1502.
10	14.44	32.11	10	23.89	403.0	0.40	0.02	1502.
20	14.43	32.12	20	23.90	402.4	0.81	0.08	1502.
30	14.41	32.13	30	23.91	401.2	1.21	0.18	1502.
50	9.68	32.52	50	25.09	288.8	1.89	0.46	1487.
75	8.14	32.62	75	25.41	259.0	2.57	0.89	1482.
100	7.04	33.01	99	25.88	215.0	3.16	1.42	1478.
125	7.30	33.41	124	26.15	189.4	3.67	2.00	1480.
150	7.18	33.67	149	26.37	169.1	4.12	2.62	1480.
175	7.05	33.79	174	26.48	158.8	4.52	3.30	1480.
200	6.82	33.86	199	26.57	150.4	4.91	4.04	1480.
225	6.62	33.90	224	26.63	145.4	5.28	4.84	1480.
250	6.38	33.92	248	26.67	141.4	5.64	5.70	1479.
300	5.86	33.96	298	26.77	132.2	6.32	7.62	1478.

Surface Salinity and Temperature Observations

(P-77-6)

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 77- 6

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT	0/00	C	WEST
77	7	29	1640	31.152		123-30
77	7	29	1755	32.651		124- 0
77	7	29	1925	31.441		124-30
77	7	29	2042	32.540		125- 0
77	7	29	2215	32.314	12.0	125-33
77	7	30	25	31.858	14.4	126- 0
77	7	30	250	31.994	15.6	126-40
77	7	30	725	31.992	15.3	127-40
77	7	30	1055	32.158	15.1	128-40
77	7	30	1410	32.411		129-40
77	7	30	1715	32.507	14.9	130-40
77	7	30	2145	32.459		131-40
77	7	31	45	32.277	14.7	132-40
77	7	31	400	32.417		133-40
77	7	31	650	32.322	13.8	134-40
77	7	31	1050	32.376		135-40
77	7	31	1335	32.505	12.1	136-40
77	7	31	1705	32.509		137-40
77	7	31	1950	32.530	11.4	138-40
77	7	31	2335	32.543		139-40
77	8	1	220	32.534	11.4	140-40
77	8	1	545	32.545		141-40
77	8	1	825	32.554	11.1	142-40
77	8	3	0	32.574	11.1	ON STATION
77	8	4	0	32.576	11.0	ON STATION
77	8	5	0	32.539	11.2	ON STATION
77	8	6	0	32.589	11.4	ON STATION
77	8	7	0	32.550	11.3	ON STATION
77	8	8	0	32.616	11.3	ON STATION
77	8	9	0	32.601	11.4	ON STATION
77	8	10	0	32.617	11.1	ON STATION
77	8	12	0	32.624	11.3	ON STATION
77	8	13	0	32.625	11.4	ON STATION
77	8	14	0	32.613	11.4	ON STATION
77	8	15	0	32.646	12.3	ON STATION
77	8	16	0	32.625	11.6	ON STATION
77	8	17	2255	32.610	12.6	ON STATION
77	8	18	200	32.625		145-21
77	8	18	505	32.713		145-46
77	8	18	1705	32.731		146-44
77	8	18	2000	32.687		147-15
77	8	18	2150	32.739		147-32
77	8	19	400	32.727		147- 0
77	8	19	845	32.742		146-22

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 77- 6

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT	0/00	C	WEST
77	8	19	1200	32.653		146- 0
77	8	19	1450	32.652		146- 0
77	8	19	1745	32.649		146- 0
77	8	19	2030	32.602		146- 0
77	8	19	2230	32.594		145-30
77	8	20	0	32.625	12.5	ON STATION
77	8	21	0	32.623	12.7	ON STATION
77	8	22	0	32.613	12.9	ON STATION
77	8	23	0	32.591	13.0	ON STATION
77	8	24	0	32.599	12.3	ON STATION
77	8	26	0	32.597	12.5	ON STATION
77	8	27	0	32.601	12.4	ON STATION
77	8	28	0	32.572	12.4	ON STATION
77	8	29	0	32.601	12.4	ON STATION
77	8	30	0	32.600	12.5	ON STATION
77	8	31	0	32.605	15.0	ON STATION
77	9	1	0	32.591	12.7	ON STATION
77	9	2	0	32.599	14.1	ON STATION
77	9	3	0	32.596	12.8	ON STATION
77	9	4	0	32.577	12.9	ON STATION
77	9	5	0	32.612	12.9	ON STATION
77	9	6	0	32.589	12.9	ON STATION
77	9	7	0	32.581	13.2	ON STATION
77	9	8	0	32.566	12.7	145-37
77	9	9	0	32.572	13.2	ON STATION
77	9	10	0	32.574	13.2	ON STATION
77	9	11	0	32.567	14.5	ON STATION
77	9	11	1515	32.642		143-40
77	9	11	2055	32.596	13.4	142-40
77	9	12	230	32.574		141-40
77	9	12	610	32.536	13.7	140-40
77	9	12	915	32.546		139-40
77	9	12	1205	32.384	14.4	138-40
77	9	12	1450	32.383		137-40
77	9	12	1830	32.534	15.1	136-40
77	9	12	2140	32.244		135-40
77	9	13	140	32.228	15.6	134-40
77	9	13	750	32.219	15.3	132-40
77	9	13	1100	32.256		131-40
77	9	13	1435	32.555	15.7	130-40
77	9	13	1840	32.212		129-40
77	9	13	2155	32.102	14.5	128-40
77	9	14	150	32.192	14.1	127-40
77	9	14	550	31.624	14.1	126-40

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 77- 6

DATE/TIME YR MO DY GMT	SALINITY 0/00	TEMP C	LONGITUDE WEST
77 9 14 750	31.708	12.2	126- 0
77 9 14 935	31.499	12.0	125-33
77 9 14 1130	32.452		125- 0
77 9 14 1355	30.094		124-30

b DENOTES SALINITY SAMPLE TAKEN FROM A BUCKET. ALL OTHER SAMPLES TAKEN FROM THE SEAWATER LOOP

LIST OF OMISSIONS FROM DATA

Hydrographic data:

Consec. #	Depth (m)	Temp.	Sal.	O_2	Notes 1.	2.	3.	Comments
144	3481			*	*			
	4165			*	*			
	4175			*	*			

Notes (MacNeill, 1977):

1. The data is suspect because of a reversal of gradient by > .01^o/oo (salinity) or > .08 ml/l (oxygen).

2. The data is deleted because of very irregular data values (usually a mistripping or leaking bottle if both oxygen and salinity are irregular).

3. The data is deleted because duplicate samples at a depth were not within .01^o/oo (salinity) or .08 ml/l (oxygen).

STP data:

Consecutive #	Comments
14	deep cast only used as part of consecutive number 13
48	not to 300 m because bottom 10 m too erratic
80	salinity from about 1325 m to bottom not included because too erratic.

Note: all other STP's were taken as part of the MILE program and are not included in this report.

Pacific Marine Science Report 78-2

OBSERVATIONS OF SEAWATER TEMPERATURE AND SALINITY AT BRITISH COLUMBIA SHORE STATIONS

1974

By

L.F. Giovando

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Sidney, B.C.

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V8L 4B2

Pacific Marine Science Report 78-2

OBSERVATIONS OF SEAWATER TEMPERATURE AND SALINITY AT BRITISH COLUMBIA SHORE STATIONS 1974

By

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January 1978

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Abstract

Surface (approx. 1-metre) oceanic salinity and/or temperature have been recorded daily at several locations along the coast of British Columbia for varying lengths of time - from a few months to a few decades. At present, such data are being gathered at sixteen places - of which fifteen are Ministry of Transport lightstations, the remaining one being the Pacific Biological Station, Departure Bay. Temperatures are determined at all sites by means of mercury-in-glass thermometers; salinities are obtained at fourteen sites only, by means of hydrometers. The data so obtained during each calendar year are published in two forms. Firstly, tables provide, for each site, the monthly means and the associated standard deviations, as well as the maximum and minimum values recorded during each month; the annual means are also listed. Secondly, graphs indicate the behaviour, throughout the year, of the data after the higher-frequency oscillations (e.g., those of tidal period) have been removed ("smoothed") by means of a seven-day normally-weighted running mean.

This publication presents the data obtained in 1974.

Introduction

Daily observations of sea-surface temperature and salinity have been made since the early 1930s at numerous locations along the British Columbia coast. During 1974 observations were made at 16 shore stations (page 6). Table 1 lists these stations in north-to-south order along the "outside coast" (Langara Island to Race Rocks) and along the Strait of Georgia (Cape Mudge to Active Pass). The general location of each station, as well as the names of the observers that participated, are also noted. Most of the sampling sites are at lightstations, and the voluntary services of the lightkeepers as observers have been obtained by arrangement with the Ministry of Transport. The Cape St. James station is a combined radiobeacon and meteorological station, and the services of the staff there have been obtained through the kind permission of the Regional Director, Atmospheric Environment Service. The observers at the lightstations receive a payment from Ocean and Aquatic Sciences, of the Department of Fisheries and the Environment, for their work.

This report presents the seawater data obtained from these shore stations during 1974.

Observational Equipment and Procedures

Except at Active Pass, each daily observation is made within one hour before (and as near as possible to) the occurrence of the daytime high tide. The exact time is dependent both upon weather conditions and upon the press of the observer's lightkeeping duties. At Active Pass, observations are made at daylight high-water slack as obtained from the Canadian Tide and Current Tables (Canadian Hydrographic Service, 1974). No sampling is attempted in darkness at any station.

Temperatures are measured by means of a mercury-in-glass thermometer recording within the range 10° to 140° Fahrenheit (F); it is graduated in 1° F intervals. Each thermometer is checked against a calibrated thermometer; the maximum allowable error is taken to be ±0.4°F (±0.2°C). The seawater temperatures are estimated to 0.1°F. The thermometer, (partially) enclosed in a protective case of 1-in (2.5-cm) aluminum pipe, is attached to the end of a pole (also made of aluminum pipe) which can be as long as about 20 ft (6 m). The thermometer is lowered into the water to a depth of 3 ft (about 1 m) and left at that depth for two minutes. The greatest pole lengths are necessary at sites where observations are carried out from steep ledges. At some stations, water samples are obtained by bucket during inclement weather.

At every station except Sheringham Point and Cape St. James[1], a 25-oz (710-cc) glass or plastic bottle is also attached to the pole. At the same time that the temperature of the seawater is recorded, a sample is drawn from this bottle, for use in the measurement of density by means of a hydrometer. The hydrometers employed are similar to those used by the U.S. Coast and Geodetic Survey (USC&GS) at its tidal stations. (Since 1970, the

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[1] Density (and, therefore, salinity) measurements were terminated at Sheringham Point on 31 March 1970 and at Cape St. James on 31 May 1971.

USC&GS has been a part of the National Ocean Surveys of the National Oceanic and Atmospheric Administration (NOAA).)

Hydrometers actually measure the *specific gravity* of a seawater sample. Specific gravity is a ratio of two densities and is therefore a dimensionless quantity. If however, by definition, distilled water at a temperature of 39.2°F (4°C) has a density $\rho_m = 1$, then the specific gravity of a substance having density ρ is ρ/ρ_m and is numerically equal to the value of ρ.

The density (or specific gravity) of a seawater sample depends upon both the quantity of dissolved material in the sample (the "salinity") and the sample temperature at the time the measurement is made. Densities determined by hydrometer without temperature control must therefore be reduced to some "standard" temperature for conversion to the corresponding salinities. The standard adopted for this program is 15°C (59°F), the same as that presently in use by the USC&GS.

An expression of the general form *Sp. Gr. Tp. (or Temp.)* 15/4°C is provided on every hydrometer utilized in this program. It incorporates both the basis of specific gravity (distilled water at 4°C (39.2°F)) and the standard temperature (15°C or 59°F) employed.

Hydrometers are supplied to the stations in one or more of three ranges of specific gravity: 0.9960 - 1.0110, 1.0100 - 1.0210, and 1.0200 - 1.0310. The scales are divided into intervals of 0.0002, and the instruments are believed accurate to ±0.0001. The hydrometers are read employing techniques described by the USC&GS (Adams, 1942). Each instrument has its calibration checked immediately before being sent to a station.

The time of each daily observation, and the associated seawater temperature and hydrometer readings, are recorded on monthly field sheets. At present, such sheets are mailed to the Pacific Environment Institute, West Vancouver, British Columbia, every two months for preliminary processing.

Preliminary Processing of the Data

This stage consists of several operations. The temperature data are scanned, and values are rejected if it is discovered that a faulty thermometer has been used, or if the value is obviously the result of a mis-reading or of any other error in technique. The accuracy of "good" individual readings should be within ±0.4°F (±0.2°C). The observed hydrometer readings are reduced to densities at the standard temperature, 15°C (59°F), by means of tables prepared by the USC&GS (Zerbe and Taylor, 1953). The appropriate calibration correction is then applied to each such density value. These corrected values are in turn converted to salinities. A salinity is rejected, again, only if obviously due to misreading of the hydrometer or to other procedural errors. It may be noted that comparisons involving several dozen samples collected at B.C. shore stations have indicated that about 85% of the "hydrometer" salinity data agreed, to within ±0.3‰, with the corresponding values determined by laboratory salinometer (Hollister, unpublished).

If observations are missing for *one* day or for *two consecutive* days, the resulting gap is filled by value(s) obtained by linear interpolation utilizing the two observations bounding the gap. No interpolated values are provided when readings are missed for *three or more* consecutive days (whether by accident or by design).

Machine Processing of the Data

For each calendar year, the daily temperature and salinity data remaining after the preliminary procedures noted above are processed into final form by the Marine Environmental Data Service (MEDS) of Ocean and Aquatic Sciences, Department of Fisheries and the Environment, Ottawa. For each station, this machine processing involves the computation of the twelve monthly means for temperature and for salinity, as well as of the corresponding standard deviations. The annual means are also determined. All means are rounded off to the first decimal place, and the standard deviations are truncated at the second decimal place. Data obtained by interpolation are *not* utilized in the computation of the means.

A form of smoothing has been performed on the data to minimize the effect of any variability associated with frequencies large compared to the annual frequency (those associated with tides, for example). For simplicity, the daily values at each sampling station are here considered to be equally-spaced in time - with a sampling interval, therefore, of 24 hours. A seven-day, normally-weighted running mean (e.g., Holloway, 1958) has been utilized for smoothing; this form of filtering is considered to result in an output free of such defects as "polarity reversals" or phase shifts. The running mean is computed, for the entire year, for both temperature and salinity. In order that these means for each station be as continuous as possible consistent with the data involved, interpolated daily values *have* been utilized in the associated computations. However, when a period of greater-than-two consecutive days of missed data is encountered, the computations are interrupted.

Presentation of the Data

The first major section of this report (pp. 14 to 77) subsequent to the text tabulates, in monthly format for each shore station in 1974, the daily values of temperature in °F and of salinity in parts per thousand (ppt, °/₀₀). Three months' data are listed on each page. Also recorded for each month are the mean, the standard deviation (STD, DEV.), the number of observations (OBSVNS.) involved in the computations of these two quantities, and the maximum and minimum values. With the December values for each station are also included the *annual* means (YRLY. MEANS) for temperature and salinity. Each interpolated daily value is identified by an asterisk (*). "Missed" values with which no interpolation is associated are each denoted by a "*0.0" entry. Invalid days, such as April 31, are indicated by a "0.0" entry. On each page, the latitude and longitude of each station (in degrees, minutes and seconds) are noted immediately after the station designation.

It may be noted that, for ease in reference, the monthly- and annual-mean temperatures and salinities are summarized in Tables 2 and 3 respectively. Temperatures in Table 2 are given in °C (rounded to the first decimal place) rather than in °F, in deference to the almost-universal use of the Celsius system of temperature measurement in present-day marine science.

"Annual" graphs of the seven-day, normally-weighted running mean for temperature and salinity at each station comprise the second major section of the report (pp. 80 to 111). These graphs are copies of the machine plots of the means - reduced for display by present-size pages. Any interruption in the associated computations will result in a gap in the plotted output. Each graph for temperature is provided with a scale in degrees C as well as one in degrees F.

It will be seen that, subsequent to April 1974, there occurred a marked increase in the number of missed salinity and temperature observations at Departure Bay. This loss of data has resulted primarily from the fact that, from May 1974 onward, circumstances beyond the control of the program have rendered it impossible to carry out observations on weekends (Saturdays and Sundays) and on statutory holidays. The number of (non-interpolated) values available for determination of each monthly mean has therefore been reduced from, approximately, thirty to twenty at this station. The running-mean calculations have suffered accordingly.

At Active Pass, the daily salinity values (and the associated running means) were relatively low - often < 20°/₀₀ - during June through August. The salinity range utilized on page 111 has therefore been chosen to be 16 to 30°/₀₀, rather than 20 to 34°/₀₀ as in the other running-mean plots for salinity. It is felt that the *variability* in the mean during the three-month period can thus be better displayed.

Acknowledgements

This sampling program owes its success primarily to the efforts and dedication of the many observers who have taken, or are taking, part in the obtaining of the data. These observers have maintained a remarkable continuity of effort, often in the face of extremely hazardous weather and sea conditions. Excellent assistance has been received from the District Managers and the staffs of the Marine Transportation Division, Ministry of Transport (M.O.T.) in Victoria and Prince Rupert, as well as from the M.O.T. Radio Branch, which has transmitted the numerous messages involved in the program. The computations on the data were carried out by the Data Processing and Analysis Section of MEDS, under the supervision of Mr. J. Nasr.

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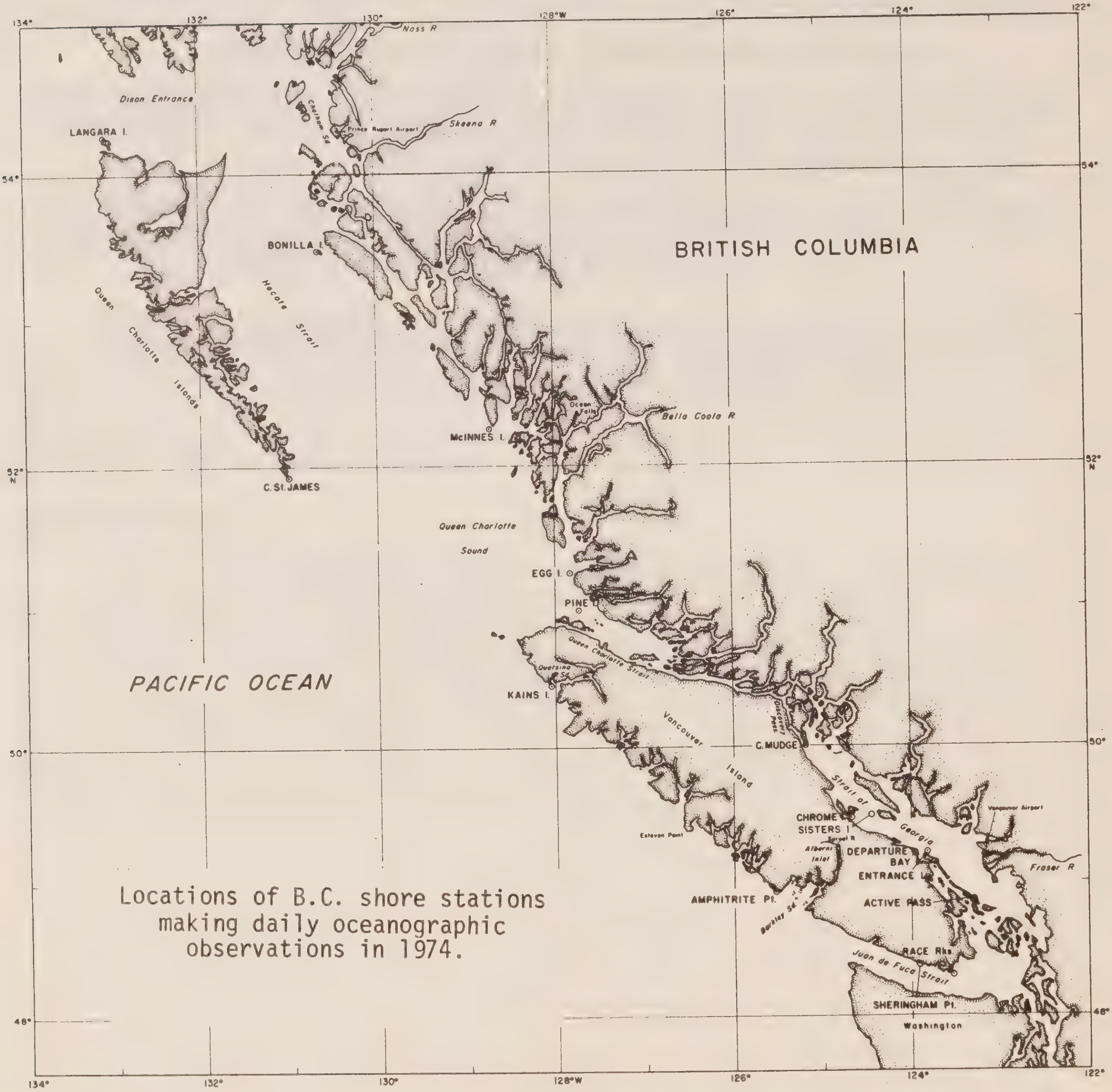


Locations of B.C. shore stations making daily oceanographic observations in 1974.

Table 1. B.C. shore stations making oceanographic observations in 1974: general locations, and names of observers.

Station	Location	Observer(s)
Langara Island	Dixon Entrance, south side	S.G. Westhaver T.E. Carr
Bonilla Island	Hecate Strait, north	S.F. McIlroy G.B. Agnew
McInnes Island	Milbanke Sound entrance, north side	F.M. Collette (Mrs.) J.M. Collette G. Arnold
Cape St. James	Queen Charlotte Islands, south end	D.L. Kupillas
Egg Island	Smith Sound, southern entrance	S.A. Bell (Mrs.) K.W. Millsip (Miss)
Pine Island	Queen Charlotte Strait, western entrance	V.C. Emrich (Mrs.) M.C. Tutt (Mrs.)
Kains Island	Quatsino Sound entrance, north side	L.C. Collins (Mrs.) J. Coldwell
Amphitrite Point	Barkley Sound, western entrance	O.A. Edwards I.G. McNeil J.K. Nuttall
Sheringham Point	Juan de Fuca Strait northern shore	E.S. Bruton (Mrs.)
Race Rocks	Juan de Fuca Strait, eastern end	A.A. Anderson (Miss)
Cape Mudge	Strait of Georgia, northern entrance	C.W.A. Egg R. Wilkie R. Lundy
Sisters Island	Strait of Georgia, central	D.J. McNeil W. Milne A. Bartle
Chrome Island	Strait of Georgia, central western shore	T. Haraldson W.E. Gardner
Departure Bay	Strait of Georgia, central western shore	D. Pozar

continued

Table 1. continued

Station	Location	Observer(s)
Entrance Island	Strait of Georgia, central western shore	E. Cehak (Mrs.)
Active Pass	Strait of Georgia, southwestern shore	J.E. Ruck

Table 2. Monthly- and annual-mean temperatures (°C) - 1974.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	5.4	5.9	5.9	7.1	8.2	9.6	11.0	11.9	12.3	11.2	9.2	7.9	8.8
Bonilla I.	5.6	5.8	6.6	7.8	9.5	11.2	12.2	12.6	11.2	10.3	8.6	7.6	9.2
McInnes I.	6.2	6.1	6.3	7.6	8.8	10.6	12.8	12.9	13.6	10.9	8.7	7.8	9.4
Cape St. James	7.2	6.9	6.7	7.4	8.3	9.4	11.2	12.9	12.5	9.9	8.8	8.2	9.2
Egg I.	6.3	6.5	6.9	8.3	9.6	11.0	12.3	13.4	12.1	10.0	8.8	7.6	9.4
Pine I.	6.8	6.9	6.9	7.6	8.2	8.9	9.3	9.7	9.6	8.9	8.7	7.9	8.3
Kains I.	6.4	7.3	7.4	8.6	9.9	10.9	12.7	12.6	13.9	11.3	9.3	8.4	9.9
Amphitrite Pt.	7.3	7.6	7.7	9.0	10.0	10.7	13.0	14.0	13.4	11.2	9.4	9.1	10.3
Sheringham Pt.	7.3	7.3	7.3	8.2	8.7	9.5	10.2	10.9	10.3	9.6	8.5	8.4	8.9
Race Rocks	7.3	7.2	7.4	8.2	8.6	9.7	10.1	10.9	10.7	9.8	8.6	8.3	8.9
Cape Mudge	6.5	6.9	7.7	8.8	11.1	12.0	14.1	13.6	13.3	10.2	8.6	8.0	10.4
Sisters I.	6.1	6.4	7.1	8.7	11.2	14.1	16.2	16.6	16.2	11.5	8.9	7.8	10.9
Chrome I.	6.4	6.7	7.0	8.3	10.2	13.3	15.4	16.7	15.2	11.2	8.8	8.1	10.6
Departure Bay	5.5	6.1	7.1	9.1	11.5	14.8	15.8	16.4	15.2	10.1	8.4	7.2	10.3
Entrance I.	6.3	6.7	6.9	8.7	11.2	12.6	15.4	16.2	15.4	11.7	8.8	7.9	10.8
Active Pass	6.2	6.8	7.1	8.6	10.1	13.3	14.9	15.7	14.1	11.1	8.8	7.9	10.4

Table 3. Monthly- and annual-mean salinities (ppt, °/₀₀) - 1974.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	32.0	31.8	32.1	31.9	32.1	32.0	31.7	32.0	31.8	31.3	31.5	31.7	31.8
Bonilla I.	30.6	30.6	30.5	30.4	30.3	30.3	30.4	30.5	30.7	30.2	30.0	30.4	30.4
McInnes I.	31.0	30.6	30.5	30.3	29.7	29.6	28.7	29.8	30.1	29.7	30.0	30.9	30.1
Egg I.	31.0	31.2	31.2	30.7	29.8	28.6	27.9	29.0	30.4	30.1	31.6	31.7	30.3
Pine I.	30.8	30.8	30.5	30.5	30.9	31.2	31.2	31.4	31.4	31.5	31.5	31.2	31.1
Kains I.	29.0	28.5	28.8	28.9	29.8	31.1	31.5	32.3	32.0	31.8	30.7	29.4	30.3
Amphitrite Pt.	28.1	26.6	27.2	28.1	28.9	30.3	29.3	29.9	30.2	30.3	29.2	27.9	28.9
Race Rocks	31.2	30.9	31.0	31.2	31.6	31.1	30.9	30.5	31.3	31.7	32.1	31.8	31.3
Cape Mudge	28.4	28.4	28.3	28.2	27.6	27.5	26.1	27.1	27.0	28.7	29.2	29.1	27.9
Sisters I.	28.5	28.4	28.6	28.1	26.0	24.3	21.6	25.6	26.2	28.6	29.2	29.2	27.0
Chrome I.	28.1	28.3	28.1	27.8	27.8	26.1	24.8	26.6	27.3	29.1	28.9	29.5	27.7
Departure Bay	26.1	26.1	25.9	26.0	24.0	23.4	20.8	25.1	26.0	28.0	28.4	26.5	25.6
Entrance I.	27.3	27.6	27.0	26.8	24.5	23.6	20.3	24.1	25.5	27.7	28.1	28.2	25.8
Active Pass	28.4	28.5	27.7	27.2	24.6	22.2	19.1	22.2	25.4	27.6	28.6	29.3	25.9

Tabulations of Daily Sea-Surface

Temperature and Salinity

1974

TEMP: Temperature (°F)

SAL: Salinity (ppt, °/₀₀)

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.6	31.8	39.8	32.0	42.3	31.9
2	42.0	31.8	41.4	31.8	42.0	31.9
3	42.4	31.9	41.6	32.0	42.4	32.3
4	42.4	31.6	41.4	32.0	42.1	32.1
5	42.0	32.0	42.1	32.0	42.0	32.0
6	42.4	32.0	42.6	31.8	41.8	32.4
7	42.4	31.9	42.8	31.6	40.7	32.3
8	42.6	32.0	42.9	31.5	* 41.2	* 32.2
9	42.7	32.5	42.8	31.6	41.8	32.1
10	41.9	32.5	42.8	31.6	41.9	31.9
11	41.9	31.9	42.6	31.5	42.5	32.3
12	41.3	31.9	42.0	31.6	42.6	32.0
13	40.2	32.1	42.1	31.6	42.5	32.0
14	40.0	31.9	42.9	31.9	42.5	32.3
15	* 39.5	* 31.8	43.2	31.9	41.9	32.0
16	39.0	31.6	42.9	32.0	42.1	32.0
17	40.5	31.9	43.3	31.8	41.9	32.0
18	41.2	31.9	43.4	32.1	42.4	32.4
19	41.7	32.0	44.0	31.9	42.9	32.0
20	41.3	32.0	43.6	31.9	42.6	32.0
21	41.4	32.1	42.5	31.8	43.0	31.9
22	42.4	31.9	42.4	31.8	43.2	32.1
23	42.8	32.0	42.9	32.0	43.4	32.1
24	42.6	31.6	43.6	31.9	43.7	32.1
25	42.5	32.1	42.5	31.9	43.4	32.1
26	42.7	32.0	43.1	31.9	44.0	32.1
27	42.5	31.8	42.7	31.9	44.4	31.9
28	41.6	31.9	42.3	31.8	44.5	31.9
29	41.4	32.4	0.0	0.0	* 43.8	* 31.9
30	40.9	31.9	0.0	0.0	43.1	32.0
31	* 40.4	* 31.9	0.0	0.0	41.2	31.8
MEANS	41.8	32.0	42.6	31.8	42.6	32.1
OBSVNS.	29	29	28	28	29	29
MAXIMUM	42.8	32.5	44.0	32.1	44.5	32.4
MINIMUM	39.0	31.6	39.8	31.5	40.7	31.8
STD.DEV.	.94	.22	.84	.17	.88	.16

LANGARA ISLAND 54 15 19 N 133 03 30 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.2	31.9	45.4	32.1	46.9	32.5
2	44.1	32.1	45.6	31.9	47.7	32.3
3	44.1	32.1	45.7	31.9	48.3	32.5
4	44.1	32.1	46.1	32.0	48.4	32.4
5	43.8	31.9	46.1	31.5	47.8	32.5
6	44.2	32.0	46.7	31.2	49.2	32.5
7	44.3	32.0	46.7	31.9	48.7	32.4
8	44.6	32.1	46.7	31.6	49.1	32.4
9	45.6	32.1	46.8	31.6	49.4	32.3
10	45.0	32.0	46.9	31.6	49.6	32.0
11	44.8	31.8	46.9	31.6	50.8	31.9
12	45.1	32.0	47.0	31.9	51.0	32.0
13	* 44.8	* 32.0	46.7	31.9	49.3	31.9
14	44.5	31.9	47.4	31.9	49.2	32.1
15	44.0	31.6	46.5	32.3	49.1	31.8
16	44.8	31.9	46.8	31.9	48.7	31.6
17	44.9	31.8	46.7	32.3	50.6	31.8
18	45.1	31.6	46.3	32.3	51.8	31.1
19	45.0	31.6	47.1	31.9	49.0	31.5
20	44.4	32.0	46.8	32.1	49.2	31.6
21	45.2	31.8	45.8	32.4	49.8	32.1
22	45.7	31.5	46.2	32.7	47.7	31.5
23	45.1	32.0	46.2	32.4	* 48.3	* 31.8
24	45.3	31.9	47.8	32.7	49.0	32.1
25	45.2	32.1	47.4	32.7	49.4	31.9
26	45.7	32.4	* 47.8	* 32.7	48.6	31.8
27	46.3	32.1	48.3	32.7	48.6	31.8
28	45.1	31.9	47.6	32.0	49.6	31.9
29	45.7	32.1	47.1	32.5	49.8	31.6
30	44.8	31.9	47.4	32.7	50.1	31.9
31	0.0	0.0	46.9	32.5	0.0	0.0
MEANS	44.8	31.9	46.7	32.1	49.2	32.0
OBSVNS.	29	29	30	30	29	29
MAXIMUM	46.3	32.4	48.3	32.7	51.8	32.5
MINIMUM	43.2	31.5	45.4	31.2	46.9	31.1
STD.DEV.	.68	.19	.66	.41	1.05	.36

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.7	31.5	54.7	31.5	52.5	32.1
2	50.4	31.5	58.7	32.0	52.5	32.1
3	49.4	31.5	54.6	32.1	51.3	32.7
4	50.0	31.4	54.9	32.1	52.3	32.5
5	50.6	31.2	55.7	32.9	51.0	32.0
6	50.6	31.1	54.2	32.1	51.7	32.1
7	50.4	31.5	54.4	31.9	52.1	31.6
8	51.6	31.4	54.1	32.3	51.7	31.6
9	51.7	31.5	53.7	31.5	51.6	31.5
10	50.7	31.8	54.9	31.6	55.3	31.6
11	* 50.5	* 31.8	54.9	31.1	55.0	31.8
12	50.3	31.8	53.2	31.9	55.3	31.9
13	50.7	31.2	52.2	31.9	56.1	31.9
14	50.9	31.6	53.6	31.8	55.0	32.0
15	51.0	31.6	51.8	32.0	54.8	32.0
16	50.6	31.8	51.6	32.3	55.0	32.1
17	52.3	31.9	50.7	32.3	55.3	31.9
18	53.2	31.9	50.3	32.4	54.9	32.0
19	52.0	31.9	49.8	32.5	57.6	31.9
20	51.9	31.9	* 50.0	* 32.5	57.4	32.0
21	50.7	32.1	50.2	32.4	58.3	32.0
22	51.4	32.1	51.8	32.0	56.8	32.0
23	51.9	32.0	52.0	32.1	56.3	31.9
24	54.5	32.1	52.5	31.9	56.8	31.9
25	53.1	32.0	54.0	32.0	56.6	31.8
26	53.2	31.9	54.3	32.0	55.0	31.0
27	54.0	31.8	54.8	31.8	53.8	30.8
28	54.8	32.0	55.0	31.8	52.3	31.1
29	54.2	31.9	54.3	31.8	50.8	31.5
30	54.6	30.3	54.0	32.0	50.6	31.2
31	53.6	31.6	53.8	31.8	0.0	0.0
MEANS	51.8	31.7	53.5	32.0	54.2	31.8
OBSVNS.	30	30	30	30	30	30
MAXIMUM	54.8	32.1	58.7	32.9	58.3	32.7
MINIMUM	49.4	30.3	49.8	31.1	50.6	30.8
STD.DEV.	1.59	.38	1.90	.34	2.30	.41

LANGARA ISLAND 54 15 19 N 133 03 30 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	50.9	31.1	51.4	32.1	46.8	32.1
2	52.8	31.5	51.2	31.6	47.3	31.8
3	51.7	31.9	51.2	31.8	47.1	31.8
4	51.9	31.9	50.9	31.2	47.0	31.8
5	50.8	31.6	50.6	31.5	47.4	31.5
6	53.3	31.2	49.8	31.5	* 47.5	* 31.5
7	53.5	30.7	49.4	30.8	47.7	31.6
8	53.3	30.8	49.4	31.0	47.7	31.5
9	52.6	31.0	50.4	31.4	47.1	31.5
10	51.4	31.4	50.5	31.4	47.3	31.8
11	51.5	30.6	49.3	31.6	46.4	31.0
12	52.4	31.4	48.9	31.4	46.5	31.8
13	51.2	31.5	47.7	31.4	46.2	31.6
14	53.2	31.4	48.2	31.5	46.8	31.8
15	52.8	31.2	49.3	31.8	46.8	31.9
16	51.6	31.6	47.7	31.6	46.0	31.9
17	51.2	31.5	47.4	31.5	44.7	31.5
18	53.2	31.4	47.7	31.8	46.1	31.6
19	51.9	31.5	47.2	31.5	45.8	31.6
20	51.9	31.6	46.7	31.4	45.6	31.6
21	51.4	31.4	46.0	31.2	45.0	31.5
22	53.3	30.8	46.9	31.5	45.4	31.2
23	52.6	31.0	47.2	31.8	46.1	31.5
24	52.5	31.2	47.7	31.4	46.8	31.8
25	53.0	31.0	46.4	31.4	45.8	31.6
26	52.9	31.5	47.8	31.5	45.0	31.6
27	52.7	31.2	47.6	31.5	44.7	31.6
28	52.0	31.4	48.4	31.6	45.1	31.9
29	51.6	31.2	47.8	31.6	45.4	31.8
30	51.9	31.5	47.5	31.6	45.0	32.4
31	51.3	31.8	0.0	0.0	44.9	32.0
MEANS	52.2	31.3	48.6	31.5	46.2	31.7
OBSVNS.	31	31	30	30	30	30
YRLY.MEANS..............................					47.9	31.8
MAXIMUM	53.5	31.9	51.4	32.1	47.7	32.4
MINIMUM	50.8	30.6	46.0	30.8	44.7	31.0
STD.DEV.	.81	.33	1.57	.25	.95	.26

BONILLA ISLAND 53 29 39 N 130 38 04 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1974
1	42.5	30.4	41.0	31.2	42.0	30.6
2	42.2	30.2	40.2	30.4	41.0	30.2
3	41.5	30.7	41.8	30.2	42.5	30.0
4	42.0	30.4	42.2	31.1	42.0	30.2
5	41.5	30.4	41.8	30.8	42.3	30.2
6	42.2	30.6	42.2	30.4	42.3	29.9
7	41.2	30.4	42.9	30.8	43.0	31.0
8	42.2	30.6	42.8	31.1	42.0	30.4
9	41.7	30.4	42.5	31.1	43.2	30.3
10	41.0	30.4	42.7	30.8	43.0	30.6
11	38.5	30.6	42.6	30.8	44.0	30.4
12	41.8	30.7	42.0	30.6	44.2	31.0
13	38.2	30.6	42.8	30.3	45.0	31.4
14	* 0.0	* 0.0	42.4	30.8	45.2	31.1
15	* 0.0	* 0.0	42.1	30.4	44.5	30.8
16	* 0.0	* 0.0	42.5	30.4	43.2	30.0
17	41.0	30.4	42.5	30.3	42.8	30.3
18	* 41.5	* 30.7	43.0	30.6	43.0	30.3
19	42.0	31.0	43.2	30.8	44.0	30.4
20	41.8	30.7	42.8	30.8	43.8	30.4
21	42.2	30.4	* 43.3	* 30.4	44.0	30.7
22	43.5	30.6	43.8	30.0	44.8	30.2
23	43.8	30.6	42.0	29.9	47.0	31.0
24	43.2	30.8	43.2	30.6	45.5	30.8
25	43.0	30.8	42.2	30.3	44.0	30.7
26	43.2	30.7	44.0	30.4	44.2	30.2
27	43.4	30.8	41.6	29.9	45.5	30.6
28	43.2	31.0	42.5	30.6	44.8	30.8
29	42.5	31.0	0.0	0.0	45.2	30.8
30	41.5	30.7	0.0	0.0	45.7	30.3
31	* 41.2	* 30.9	0.0	0.0	45.4	30.8
MEANS	42.0	30.6	42.4	30.6	43.8	30.5
OBSVNS.	26	26	27	27	31	31
MAXIMUM	43.8	31.0	44.0	31.2	47.0	31.4
MINIMUM	38.2	30.2	40.2	29.9	41.0	29.9
STD.DEV.	1.32	.21	.78	.36	1.39	.36

BONILLA ISLAND 53 29 39 N 130 38 04 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.5	30.7	47.8	30.4	49.5	30.4
2	45.4	30.6	47.4	30.4	50.2	29.7
3	44.6	30.4	46.2	29.9	51.5	30.3
4	46.2	30.0	46.3	29.9	53.5	30.0
5	44.8	30.2	47.6	30.0	50.8	30.0
6	44.7	30.6	48.0	30.2	52.8	30.0
7	47.2	30.3	49.2	30.4	52.2	30.4
8	44.2	30.7	49.3	30.7	52.8	30.6
9	48.0	30.2	49.5	30.4	50.5	30.4
10	45.4	30.6	50.3	30.7	51.8	30.7
11	45.7	30.3	50.5	30.8	52.5	30.6
12	47.3	30.4	49.2	30.4	52.7	30.6
13	46.5	30.6	46.8	29.9	52.5	30.3
14	46.2	30.6	48.0	30.4	53.0	30.0
15	47.0	30.6	48.6	30.2	51.8	30.0
16	43.7	30.0	48.5	30.2	52.8	30.6
17	44.7	30.2	48.9	30.7	53.6	30.7
18	45.8	30.0	48.4	30.2	52.0	30.7
19	45.5	29.9	48.6	30.2	52.7	30.0
20	44.5	30.2	49.8	30.7	51.8	30.6
21	47.0	29.9	50.3	30.6	51.7	30.0
22	47.0	30.0	48.8	29.9	53.0	30.6
23	* 46.7	* 30.3	51.0	30.6	53.7	30.8
24	46.5	30.6	52.2	30.4	54.4	30.7
25	46.9	30.7	51.0	30.6	52.2	30.8
26	47.5	30.7	50.2	29.8	51.4	30.8
27	48.5	30.4	51.5	29.9	52.8	30.3
28	47.0	30.7	49.7	30.2	51.8	29.8
29	46.9	30.3	48.8	30.2	51.8	29.5
30	45.8	30.2	50.5	29.9	51.5	29.8
31	0.0	0.0	49.2	29.9	0.0	0.0
MEANS	46.1	30.4	49.1	30.3	52.2	30.3
OBSVNS.	29	29	31	31	30	30
MAXIMUM	48.5	30.7	52.2	30.8	54.4	30.8
MINIMUM	43.7	29.9	46.2	29.8	49.5	29.5
STD.DEV.	1.20	.27	1.46	.30	1.07	.37

BONILLA ISLAND 53 29 39 N 130 38 04 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.6	30.3	55.7	30.2	50.0	30.8
2	53.0	30.3	56.0	30.4	50.0	30.6
3	52.5	29.9	56.8	31.1	50.8	31.1
4	52.2	29.9	57.2	31.0	50.0	30.7
5	51.6	30.6	58.0	31.0	50.0	30.7
6	52.8	30.6	58.7	30.7	52.2	31.2
7	52.0	30.8	58.4	30.7	51.5	31.1
8	51.8	30.8	59.0	30.7	52.0	30.0
9	52.0	30.6	56.5	30.2	53.5	30.2
10	53.3	30.7	56.0	30.2	53.8	30.4
11	53.0	30.4	55.2	30.3	52.7	30.8
12	53.6	30.7	55.0	30.6	54.0	30.4
13	54.3	30.4	51.0	30.0	53.9	30.4
14	54.4	30.8	53.2	30.0	52.4	31.1
15	53.5	30.6	55.0	29.9	52.2	30.8
16	54.5	30.0	52.0	30.3	53.1	30.4
17	54.9	30.2	51.8	30.6	53.6	30.6
18	55.6	30.4	53.6	30.6	52.8	30.6
19	54.3	29.9	54.5	30.7	52.9	30.4
20	55.0	30.2	54.2	30.2	55.1	30.3
21	54.4	30.2	53.3	30.6	54.5	30.6
22	54.6	30.2	53.7	30.7	52.4	30.6
23	54.9	30.7	54.4	30.4	51.9	30.8
24	55.8	30.2	53.9	30.4	50.8	30.7
25	54.7	30.4	53.8	30.4	51.5	30.7
26	54.2	29.9	54.5	29.9	51.2	30.7
27	54.4	30.4	53.5	30.6	51.5	30.7
28	54.5	30.4	52.5	30.6	51.0	30.8
29	54.2	30.4	53.0	30.6	51.2	30.7
30	55.0	30.4	51.3	30.8	50.4	30.7
31	55.5	30.3	50.5	30.8	0.0	0.0
MEANS	53.9	30.4	54.6	30.5	52.1	30.7
OBSVNS.	31	31	31	31	30	30
MAXIMUM	55.8	30.8	59.0	31.1	55.1	31.2
MINIMUM	51.6	29.9	50.5	29.9	50.0	30.0
STD.DEV.	1.18	.28	2.26	.32	1.43	.27

BCNILLA ISLAND 53 29 39 N 130 38 04 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.3	30.0	49.2	30.2	42.5	30.3
2	51.2	30.3	49.5	29.9	46.5	30.0
3	50.7	30.2	49.0	29.7	47.5	30.3
4	51.5	30.7	49.3	29.7	47.0	30.3
5	51.4	30.4	49.0	30.2	47.0	30.6
6	50.9	30.0	49.0	29.9	46.8	30.6
7	51.3	30.4	49.0	29.7	47.0	30.0
8	51.9	29.9	* 48.9	* 30.1	46.8	30.6
9	51.1	30.6	48.8	30.6	46.2	30.2
10	49.8	30.2	49.5	30.4	45.6	30.3
11	50.0	29.9	48.2	30.2	46.2	30.6
12	50.8	30.3	48.8	30.4	45.5	30.7
13	50.6	30.8	48.5	30.2	45.3	30.7
14	49.5	29.9	48.3	30.2	46.4	30.8
15	51.0	30.3	48.2	30.2	46.4	30.3
16	51.0	30.3	47.8	30.2	* 45.6	* 30.5
17	50.8	30.6	46.2	29.8	44.8	30.7
18	52.0	30.7	47.2	29.7	* 45.3	* 30.5
19	50.8	30.6	46.0	29.8	45.8	30.4
20	50.7	30.6	45.5	29.8	45.7	30.8
21	49.5	30.4	43.3	29.7	45.5	30.6
22	* 49.9	* 30.4	44.8	29.4	45.2	30.7
23	50.4	30.4	46.2	29.8	45.0	30.7
24	50.0	29.9	46.0	29.8	45.8	30.4
25	49.8	29.7	46.5	30.0	45.1	30.2
26	50.2	29.7	* 46.5	* 29.7	45.5	30.7
27	50.5	30.2	46.5	29.5	44.7	30.3
28	49.6	30.2	46.2	29.8	44.5	30.2
29	49.8	30.2	47.5	30.4	44.8	30.3
30	49.8	29.9	47.0	30.3	44.6	30.4
31	50.5	29.8	0.0	0.0	45.1	30.3
MEANS	50.6	30.2	47.5	30.0	45.7	30.4
OBSVNS.	30	30	28	28	29	29
YRLY.MEANS........					48.5	30.4
MAXIMUM	52.0	30.8	49.5	30.6	47.5	30.8
MINIMUM	49.5	29.7	43.3	29.4	42.5	30.0
STD.DEV.	.70	.31	1.61	.31	1.04	.23

MCINNES ISLAND 52 15 48 N 128 43 10 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.6	30.4	41.6	30.8	41.5	29.8
2	42.2	30.4	42.5	30.8	41.2	29.7
3	41.8	30.6	42.5	31.1	41.5	30.0
4	41.9	30.6	42.5	30.8	43.5	30.7
5	41.9	30.6	42.4	30.2	42.5	30.4
6	42.0	30.6	41.5	30.3	41.7	30.2
7	42.2	30.7	42.5	30.7	43.8	30.4
8	43.2	31.0	42.8	30.8	44.1	30.8
9	42.3	30.8	43.6	30.8	44.4	31.2
10	43.0	30.7	43.3	30.8	43.8	31.2
11	42.6	31.1	43.2	30.8	43.2	31.0
12	43.8	31.6	43.1	30.6	43.3	30.8
13	44.0	31.4	43.3	30.7	43.4	30.8
14	42.6	30.8	43.8	30.7	43.0	30.3
15	41.8	31.1	44.3	31.1	42.7	30.6
16	41.3	31.0	43.8	30.8	43.2	30.7
17	42.5	31.2	42.8	30.4	43.2	30.6
18	43.8	31.6	43.1	30.7	43.0	30.4
19	43.8	31.2	43.5	30.7	43.5	30.2
20	43.9	31.2	43.8	30.7	43.5	30.3
21	44.0	31.4	43.3	30.7	43.3	30.2
22	44.3	31.2	43.3	30.7	43.5	30.3
23	44.4	31.1	43.3	30.7	43.5	30.2
24	44.4	31.1	43.7	30.7	44.0	30.4
25	44.3	31.2	43.3	30.8	44.0	30.3
26	44.2	31.0	42.0	30.3	44.0	30.3
27	44.2	31.1	42.3	30.2	44.1	30.6
28	44.1	31.2	41.3	29.3	43.7	30.6
29	43.5	31.2	0.0	0.0	44.0	30.6
30	42.8	31.1	0.0	0.0	44.2	30.6
31	42.8	31.1	0.0	0.0	45.1	31.1
MEANS	43.1	31.0	42.9	30.6	43.3	30.5
OBSVNS.	31	31	28	28	31	31
MAXIMUM	44.4	31.6	44.3	31.1	45.1	31.2
MINIMUM	41.3	30.4	41.3	29.3	41.2	29.7
STD.DEV.	.96	.32	.75	.34	.89	.36

MCINNES ISLAND 52 15 48 N 128 43 10 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.8	30.8	46.1	31.0	49.9	29.7
2	44.7	30.8	46.1	30.0	49.2	30.4
3	44.9	30.8	46.0	30.2	48.2	30.2
4	44.7	30.6	45.5	30.6	51.2	29.1
5	45.0	30.6	45.7	31.1	49.3	29.4
6	45.1	30.8	45.9	30.4	50.0	31.2
7	45.2	31.0	46.1	30.4	50.5	29.4
8	44.9	30.3	46.2	30.4	50.3	29.4
9	45.2	30.4	46.6	30.2	50.6	29.7
10	45.1	30.6	47.1	30.4	51.0	29.0
11	45.5	31.0	48.0	30.0	53.0	28.9
12	45.6	30.7	49.2	28.5	50.7	28.8
13	45.8	30.4	46.8	30.6	50.3	29.0
14	45.6	30.3	46.5	30.8	52.0	29.0
15	45.8	30.0	46.3	29.9	52.0	28.6
16	45.2	29.8	46.8	29.7	52.8	28.9
17	45.4	30.3	48.5	28.8	53.2	28.8
18	45.5	30.3	50.8	25.9	49.8	30.0
19	45.5	30.6	49.3	28.2	52.3	29.4
20	45.4	30.7	49.4	28.5	51.8	29.5
21	45.5	31.0	50.0	28.8	49.7	29.7
22	45.4	29.9	48.2	28.8	51.0	29.7
23	45.8	29.9	48.9	29.8	52.7	30.3
24	46.3	29.8	49.2	28.9	53.3	29.9
25	46.5	29.8	47.4	30.0	53.0	30.0
26	47.2	29.8	49.3	29.8	52.8	29.8
27	48.3	29.4	49.8	30.0	52.0	30.2
28	48.2	29.4	50.6	29.5	51.3	30.3
29	46.7	29.9	49.5	29.7	50.3	30.0
30	46.3	30.8	50.2	29.5	50.2	30.2
31	0.0	0.0	50.4	29.4	0.0	0.0
MEANS	45.7	30.3	47.9	29.7	51.1	29.6
OBSVNS.	30	30	31	31	30	30
MAXIMUM	48.3	31.0	50.8	31.1	53.3	31.2
MINIMUM	44.7	29.4	45.5	25.9	48.2	28.6
STD.DEV.	.91	.47	1.72	1.04	1.37	.61

MCINNES ISLAND 52 15 48 N 128 43 10 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	50.9	30.0	57.8	28.9	57.4	30.4
2	52.5	29.8	57.2	29.0	57.3	30.4
3	52.7	28.2	55.3	29.3	56.5	30.7
4	54.8	28.5	55.4	29.5	56.3	30.7
5	53.2	29.0	54.8	29.7	55.3	30.6
6	53.8	29.1	55.1	29.8	55.3	30.8
7	53.5	29.3	53.9	29.5	58.2	30.7
8	53.2	29.3	54.2	29.5	56.7	30.7
9	52.0	29.3	53.2	29.8	56.6	30.8
10	53.8	29.4	53.7	30.0	55.4	30.7
11	54.8	29.3	53.5	30.2	56.3	30.0
12	52.6	29.1	52.0	29.9	57.2	29.9
13	52.8	29.3	55.1	28.9	57.3	30.2
14	56.3	26.0	53.6	29.7	58.8	28.5
15	54.2	28.8	56.8	28.8	58.3	29.0
16	55.1	29.7	56.4	28.9	56.9	30.2
17	57.0	27.4	53.9	29.8	57.0	30.6
18	57.9	27.4	56.2	29.4	58.2	29.1
19	58.2	27.6	55.5	29.8	58.0	29.3
20	57.9	27.7	53.9	30.4	58.2	29.7
21	58.5	25.9	55.3	30.3	59.2	29.8
22	56.7	27.6	55.1	30.2	58.1	29.7
23	55.4	30.0	55.2	30.4	56.5	30.0
24	55.3	30.2	55.6	30.4	57.0	29.8
25	56.1	28.8	54.4	30.4	55.0	29.8
26	54.7	28.5	55.3	30.6	54.0	29.9
27	56.0	29.0	54.4	30.7	54.0	30.0
28	57.3	29.0	56.6	30.4	53.0	30.4
29	57.2	29.3	58.5	30.3	53.4	29.8
30	57.1	28.9	57.0	29.9	53.1	30.2
31	57.8	28.9	58.3	30.2	0.0	0.0
MEANS	55.1	28.7	55.3	29.8	56.5	30.1
OBSVNS.	31	31	31	31	30	30
MAXIMUM	58.5	30.2	58.5	30.7	59.2	30.8
MINIMUM	50.9	25.9	52.0	28.8	53.0	28.5
STD.DEV.	2.10	1.06	1.54	.55	1.71	.58

MCINNES ISLAND 52 15 48 N 128 43 10 W

	OCTOBER		NOVEMBER		DECEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.7	31.1	49.2	27.7	46.5	30.6
2	53.3	31.4	49.0	28.5	45.7	30.0
3	53.0	31.5	49.6	28.8	45.8	30.3
4	53.0	31.5	50.2	30.8	45.9	30.3
5	53.4	31.2	50.0	31.4	46.0	30.3
6	53.0	31.5	49.6	30.7	46.2	30.6
7	53.4	31.4	49.5	31.0	46.9	31.1
8	53.0	31.5	49.1	30.7	47.2	31.2
9	52.4	31.2	49.0	30.7	47.2	31.5
10	51.4	31.2	49.0	31.0	47.1	31.5
11	52.7	31.1	48.1	31.0	46.8	31.2
12	52.0	31.8	47.4	29.0	46.0	30.8
13	51.8	30.6	47.4	29.0	45.9	30.3
14	51.7	30.6	47.0	29.1	46.0	31.1
15	51.7	31.8	46.8	29.5	46.5	31.0
16	51.6	31.0	47.0	29.8	46.5	31.6
17	52.4	30.6	48.2	30.6	45.8	30.8
18	52.3	29.9	48.5	31.0	47.2	31.6
19	51.9	28.8	47.5	30.3	46.6	31.0
20	50.6	29.5	46.5	29.8	46.0	30.8
21	50.0	28.6	45.5	29.5	45.2	30.6
22	50.2	29.0	45.4	29.8	44.1	29.7
23	50.7	27.4	47.8	31.0	45.2	30.2
24	50.0	26.0	46.8	29.8	46.5	31.4
25	49.5	25.2	45.5	29.8	46.7	31.5
26	49.5	26.4	45.6	29.5	46.5	31.8
27	50.0	26.9	46.4	30.2	45.2	30.6
28	50.0	27.7	46.2	30.2	44.6	30.0
29	49.2	27.3	46.5	30.0	46.2	31.4
30	49.8	28.8	45.3	29.5	45.0	30.2
31	50.1	29.5	0.0	0.0	46.3	31.6
MEANS	51.6	29.7	47.7	30.0	46.1	30.9
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS....................................					48.9	30.1
MAXIMUM	54.7	31.8	50.2	31.4	47.2	31.8
MINIMUM	49.2	25.2	45.3	27.7	44.1	29.7
STD.DEV.	1.46	1.94	1.52	.88	.77	.58

CAPE ST JAMES 51 56 18 N 131 00 50 W

	JANUARY				FEBRUARY				MARCH			1974
DATE		TEMP		SAL		TEMP		SAL		TEMP		SAL
1		45.6	*	0.0		44.2	*	0.0		43.8	*	0.0
2		45.2	*	0.0	*	44.5	*	0.0		43.5	*	0.0
3		45.3	*	0.0		44.9	*	0.0		43.3	*	0.0
4		45.2	*	0.0		44.5	*	0.0		43.7	*	0.0
5	*	45.3	*	0.0		44.3	*	0.0		43.3	*	0.0
6		45.5	*	0.0		44.7	*	0.0		43.5	*	0.0
7		45.3	*	0.0		44.8	*	0.0		43.0	*	0.0
8		45.2	*	0.0		44.7	*	0.0	*	43.3	*	0.0
9		45.2	*	0.0		44.6	*	0.0	*	43.6	*	0.0
10		45.0	*	0.0		44.5	*	0.0		43.9	*	0.0
11		45.8	*	0.0		44.5	*	0.0	*	43.9	*	0.0
12		45.2	*	0.0	*	44.4	*	0.0		43.9	*	0.0
13		44.6	*	0.0		44.3	*	0.0		44.1	*	0.0
14		45.0	*	0.0		44.3	*	0.0		44.1	*	0.0
15		43.8	*	0.0		44.3	*	0.0		43.8	*	0.0
16		43.9	*	0.0		43.7	*	0.0	*	43.9	*	0.0
17		44.5	*	0.0	*	43.9	*	0.0		44.1	*	0.0
18	*	44.5	*	0.0		44.2	*	0.0		43.3	*	0.0
19	*	44.6	*	0.0		44.3	*	0.0		43.7	*	0.0
20		44.6	*	0.0	*	44.3	*	0.0		45.2	*	0.0
21		44.9	*	0.0		44.4	*	0.0		44.7	*	0.0
22		45.1	*	0.0		44.0	*	0.0	*	44.5	*	0.0
23		45.3	*	0.0	*	44.2	*	0.0		44.2	*	0.0
24		45.3	*	0.0		44.5	*	0.0		44.1	*	0.0
25		45.1	*	0.0		44.3	*	0.0		44.2	*	0.0
26		43.2	*	0.0		44.4	*	0.0		44.9	*	0.0
27	*	44.0	*	0.0		44.3	*	0.0		44.8	*	0.0
28		44.8	*	0.0		43.9	*	0.0		44.9	*	0.0
29		44.3	*	0.0		0.0		0.0		44.7	*	0.0
30	*	44.5	*	0.0		0.0		0.0	*	44.8	*	0.0
31		44.8	*	0.0		0.0		0.0		44.9	*	0.0
MEANS		44.9		0.0		44.4		0.0		44.1		0.0
OBSVNS.		26		0		23		0		25		0
MAXIMUM		45.8		0.0		44.9		0.0		45.2		0.0
MINIMUM		43.2		0.0		43.7		0.0		43.0		0.0
STD.DEV.		.59		0.00		.28		0.00		.60		0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.8	* 0.0	45.7	* 0.0	47.3	* 0.0
2	44.8	* 0.0	45.8	* 0.0	47.7	* 0.0
3	45.9	* 0.0	46.0	* 0.0	47.2	* 0.0
4	44.8	* 0.0	45.9	* 0.0	47.9	* 0.0
5	44.9	* 0.0	46.1	* 0.0	47.4	* 0.0
6	* 44.9	* 0.0	46.2	* 0.0	47.9	* 0.0
7	* 44.9	* 0.0	46.7	* 0.0	48.0	* 0.0
8	44.9	* 0.0	46.2	* 0.0	48.3	* 0.0
9	45.1	* 0.0	46.4	* 0.0	47.9	* 0.0
10	44.9	* 0.0	46.6	* 0.0	48.4	* 0.0
11	44.6	* 0.0	46.7	* 0.0	48.6	* 0.0
12	45.0	* 0.0	47.0	* 0.0	49.4	* 0.0
13	45.2	* 0.0	46.7	* 0.0	50.4	* 0.0
14	45.2	* 0.0	46.7	* 0.0	50.3	* 0.0
15	* 45.0	* 0.0	46.9	* 0.0	49.3	* 0.0
16	44.8	* 0.0	46.9	* 0.0	49.6	* 0.0
17	44.8	* 0.0	47.3	* 0.0	50.0	* 0.0
18	45.0	* 0.0	47.3	* 0.0	50.2	* 0.0
19	45.2	* 0.0	47.5	* 0.0	50.4	* 0.0
20	45.2	* 0.0	47.8	* 0.0	49.9	* 0.0
21	45.8	* 0.0	47.7	* 0.0	50.6	* 0.0
22	46.0	* 0.0	47.4	* 0.0	49.8	* 0.0
23	46.0	* 0.0	47.6	* 0.0	50.0	* 0.0
24	* 46.0	* 0.0	47.8	* 0.0	50.1	* 0.0
25	46.1	* 0.0	47.3	* 0.0	49.6	* 0.0
26	46.3	* 0.0	47.2	* 0.0	48.6	* 0.0
27	46.2	* 0.0	47.4	* 0.0	49.3	* 0.0
28	46.3	* 0.0	47.6	* 0.0	49.2	* 0.0
29	45.9	* 0.0	47.6	* 0.0	48.5	* 0.0
30	45.7	* 0.0	47.7	* 0.0	49.6	* 0.0
31	0.0	0.0	47.6	* 0.0	0.0	0.0
MEANS	45.4	0.0	46.9	0.0	49.0	0.0
OBSVNS.	26	0	31	0	30	0
MAXIMUM	46.3	0.0	47.8	0.0	50.6	0.0
MINIMUM	44.6	0.0	45.7	0.0	47.2	0.0
STD.DEV.	.56	0.00	.65	0.00	1.05	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.3	* 0.0	57.0	* 0.0	55.6	* 0.0
2	50.7	* 0.0	* 54.3	* 0.0	56.2	* 0.0
3	* 50.9	* 0.0	51.5	* 0.0	55.0	* 0.0
4	* 51.2	* 0.0	53.2	* 0.0	55.8	* 0.0
5	51.5	* 0.0	* 53.5	* 0.0	56.1	* 0.0
6	51.7	* 0.0	53.9	* 0.0	55.8	* 0.0
7	50.9	* 0.0	53.9	* 0.0	* 55.1	* 0.0
8	51.2	* 0.0	54.1	* 0.0	54.3	* 0.0
9	50.4	* 0.0	54.4	* 0.0	* 54.4	* 0.0
10	51.3	* 0.0	53.6	* 0.0	54.6	* 0.0
11	52.3	* 0.0	56.9	* 0.0	* 54.7	* 0.0
12	52.1	* 0.0	57.4	* 0.0	54.8	* 0.0
13	* 52.1	* 0.0	57.0	* 0.0	55.1	* 0.0
14	* 52.0	* 0.0	56.2	* 0.0	54.4	* 0.0
15	51.9	* 0.0	54.7	* 0.0	53.7	* 0.0
16	52.1	* 0.0	54.9	* 0.0	53.5	* 0.0
17	52.3	* 0.0	55.6	* 0.0	54.2	* 0.0
18	52.3	* 0.0	53.8	* 0.0	53.8	* 0.0
19	53.4	* 0.0	55.1	* 0.0	54.4	* 0.0
20	52.7	* 0.0	54.4	* 0.0	54.7	* 0.0
21	52.5	* 0.0	54.5	* 0.0	55.7	* 0.0
22	52.9	* 0.0	54.9	* 0.0	54.5	* 0.0
23	49.9	* 0.0	55.1	* 0.0	54.2	* 0.0
24	50.2	* 0.0	54.6	* 0.0	* 53.8	* 0.0
25	50.2	* 0.0	54.2	* 0.0	53.4	* 0.0
26	53.4	* 0.0	* 56.5	* 0.0	* 53.5	* 0.0
27	51.5	* 0.0	58.8	* 0.0	53.7	* 0.0
28	52.0	* 0.0	57.0	* 0.0	53.2	* 0.0
29	54.7	* 0.0	* 57.1	* 0.0	53.9	* 0.0
30	55.9	* 0.0	57.3	* 0.0	53.0	* 0.0
31	57.9	* 0.0	55.3	* 0.0	0.0	0.0
MEANS	52.1	0.0	55.2	0.0	54.5	0.0
OBSVNS.	27	0	27	0	25	0
MAXIMUM	57.9	0.0	58.8	0.0	56.2	0.0
MINIMUM	49.3	0.0	51.5	0.0	53.0	0.0
STD.DEV.	1.84	0.00	1.60	0.00	.93	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1974 TEMP	DECEMBER 1974 SAL
1	51.2	* 0.0	48.2	* 0.0	47.5	* 0.0
2	49.2	* 0.0	* 48.3	* 0.0	47.5	* 0.0
3	* 50.1	* 0.0	48.4	* 0.0	47.5	* 0.0
4	51.0	* 0.0	47.8	* 0.0	47.1	* 0.0
5	51.4	* 0.0	48.1	* 0.0	47.3	* 0.0
6	51.3	* 0.0	* 48.1	* 0.0	47.3	* 0.0
7	50.5	* 0.0	48.2	* 0.0	* 47.1	* 0.0
8	51.0	* 0.0	48.3	* 0.0	46.8	* 0.0
9	51.3	* 0.0	48.2	* 0.0	46.8	* 0.0
10	* 50.6	* 0.0	48.4	* 0.0	46.7	* 0.0
11	49.9	* 0.0	48.3	* 0.0	46.8	* 0.0
12	* 50.0	* 0.0	48.7	* 0.0	46.7	* 0.0
13	50.2	* 0.0	48.3	* 0.0	46.6	* 0.0
14	50.2	* 0.0	48.6	* 0.0	* 46.7	* 0.0
15	48.6	* 0.0	48.5	* 0.0	46.8	* 0.0
16	49.4	* 0.0	47.5	* 0.0	46.8	* 0.0
17	50.2	* 0.0	47.7	* 0.0	46.7	* 0.0
18	50.0	* 0.0	47.4	* 0.0	46.7	* 0.0
19	48.9	* 0.0	47.3	* 0.0	46.9	* 0.0
20	49.0	* 0.0	47.6	* 0.0	46.8	* 0.0
21	* 48.8	* 0.0	47.2	* 0.0	* 46.6	* 0.0
22	48.6	* 0.0	* 47.2	* 0.0	46.4	* 0.0
23	49.1	* 0.0	47.3	* 0.0	46.9	* 0.0
24	50.3	* 0.0	46.8	* 0.0	47.3	* 0.0
25	49.9	* 0.0	47.6	* 0.0	46.5	* 0.0
26	48.4	* 0.0	47.8	* 0.0	46.2	* 0.0
27	* 48.8	* 0.0	47.8	* 0.0	45.9	* 0.0
28	49.2	* 0.0	47.2	* 0.0	* 46.0	* 0.0
29	48.5	* 0.0	47.4	* 0.0	46.2	* 0.0
30	49.0	* 0.0	* 47.4	* 0.0	46.4	* 0.0
31	48.4	* 0.0	0.0	0.0	46.5	* 0.0
MEANS	49.8	0.0	47.9	0.0	46.8	0.0
OBSVNS.	26	0	26	0	27	0
YRLY.MEANS....................................					48.5	0.0
MAXIMUM	51.4	0.0	48.7	0.0	47.5	0.0
MINIMUM	48.4	0.0	46.8	0.0	45.9	0.0
STD.DEV.	1.00	0.00	.51	0.00	.41	0.00

EGG ISLAND 51 15 06 N 127 49 53 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.5	30.8	42.2	31.5	43.3	31.2
2	42.0	30.8	42.6	31.5	42.2	31.2
3	41.5	31.2	43.6	31.0	41.8	31.2
4	41.5	30.7	42.7	30.2	43.2	31.0
5	42.0	31.0	43.3	30.4	43.3	31.0
6	41.9	31.2	43.2	30.2	43.8	31.1
7	41.5	31.2	43.8	30.8	42.4	31.2
8	44.5	31.4	44.2	31.1	* 42.9	* 31.2
9	44.0	31.1	44.4	31.1	43.5	31.2
10	43.9	30.7	44.1	31.4	45.1	31.1
11	44.0	30.7	43.6	31.0	44.4	31.4
12	44.9	31.5	43.3	31.0	43.8	31.4
13	44.5	31.2	42.9	31.0	44.4	31.1
14	43.8	31.6	43.8	31.4	44.4	31.1
15	* 43.6	* 31.6	44.3	31.6	43.5	31.2
16	* 43.3	* 31.5	43.8	31.6	45.1	31.1
17	43.0	31.5	43.4	31.2	43.6	31.5
18	43.9	30.8	43.9	31.6	44.3	31.4
19	43.2	30.8	43.6	31.5	44.8	31.4
20	42.7	31.1	45.1	31.6	44.8	31.1
21	43.4	31.1	44.1	31.6	45.2	30.8
22	44.2	31.1	43.9	31.4	44.3	30.8
23	44.6	31.1	43.5	31.5	45.3	30.6
24	44.8	31.1	43.8	31.1	45.7	30.7
25	44.1	31.1	43.2	31.2	46.0	31.0
26	43.6	30.8	44.5	31.4	45.3	30.8
27	44.4	31.1	44.7	31.4	45.9	31.5
28	43.9	31.1	44.1	31.4	45.7	31.5
29	42.6	30.8	0.0	0.0	46.1	31.5
30	41.2	30.8	0.0	0.0	45.3	31.4
31	43.5	30.8	0.0	0.0	45.0	31.4
MEANS	43.3	31.0	43.7	31.2	44.4	31.2
OBSVNS.	29	29	28	28	30	30
MAXIMUM	44.9	31.6	45.1	31.6	46.1	31.5
MINIMUM	41.2	30.7	42.2	30.2	41.8	30.6
STD.DEV.	1.13	.25	.65	.40	1.15	.25

EGG ISLAND 51 15 06 N 127 49 53 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.6	31.6	47.5	30.3	49.6	28.8
2	44.8	31.4	47.8	30.6	49.8	29.0
3	45.0	31.1	48.0	30.6	48.7	29.1
4	46.0	31.0	49.6	30.6	52.0	28.2
5	46.4	31.5	48.7	31.2	51.0	28.9
6	45.7	31.5	48.2	30.8	51.2	29.7
7	46.2	31.2	48.9	30.6	52.2	29.4
8	46.3	31.2	47.8	30.8	53.8	28.4
9	46.9	31.2	48.2	30.8	52.9	27.7
10	46.8	31.0	47.8	30.3	50.2	27.4
11	46.2	31.2	48.4	29.7	51.8	26.7
12	46.1	31.2	50.4	28.2	50.4	28.0
13	47.1	31.0	47.1	30.2	55.6	25.8
14	46.6	30.7	46.2	30.2	50.2	28.0
15	46.4	31.0	47.3	30.8	54.7	27.4
16	47.1	29.8	48.0	30.6	53.6	26.5
17	46.4	30.0	49.3	30.3	51.8	28.0
18	46.6	30.0	51.4	29.4	50.4	30.3
19	46.1	30.4	52.3	26.4	54.7	29.0
20	47.3	30.6	53.2	27.8	54.4	27.3
21	46.4	30.7	50.4	29.3	51.6	28.9
22	46.7	31.0	49.6	29.5	55.2	28.6
23	47.7	30.6	50.3	29.8	55.0	28.1
24	48.0	30.6	51.4	28.1	51.6	29.4
25	48.2	30.3	49.3	30.0	55.8	25.8
26	49.6	30.6	50.2	30.3	48.2	31.4
27	50.4	29.5	51.3	29.9	49.1	31.6
28	49.3	30.3	49.3	29.5	48.7	30.2
29	49.6	30.3	48.6	29.4	49.6	31.1
30	47.8	29.7	49.8	27.7	50.7	30.7
31	0.0	0.0	49.3	29.0	0.0	0.0
MEANS	46.9	30.7	49.2	29.8	51.8	28.6
OBSVNS.	30	30	31	31	30	30
MAXIMUM	50.4	31.6	53.2	31.2	55.8	31.6
MINIMUM	44.6	29.5	46.2	26.4	48.2	25.8
STD.DEV.	1.40	.56	1.61	1.12	2.27	1.52

EGG ISLAND 51 15 06 N 127 49 53 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 52.1	* 27.5	60.4	26.1	53.4	31.2
2	53.6	24.2	57.4	28.5	54.7	31.0
3	51.4	29.7	56.8	28.2	55.8	30.6
4	56.1	23.1	59.4	26.1	57.4	29.5
5	53.4	28.1	58.3	27.8	52.2	31.2
6	54.1	26.1	* 56.9	* 28.1	* 52.4	* 31.0
7	55.2	22.6	55.4	28.4	52.6	30.8
8	55.4	25.0	54.1	29.8	* 51.3	* 31.1
9	54.6	26.0	* 54.6	* 29.5	50.0	31.4
10	56.7	26.0	* 55.2	* 29.2	52.1	31.2
11	56.9	26.7	55.8	28.9	52.0	31.5
12	56.7	27.1	54.9	30.0	50.8	30.8
13	54.9	25.9	53.6	29.7	* 52.9	* 30.8
14	54.7	27.2	55.0	29.9	55.0	30.7
15	54.7	29.9	57.2	29.8	54.2	30.4
16	51.8	30.7	57.9	28.9	52.2	30.4
17	51.6	28.6	56.7	30.0	52.4	31.0
18	53.2	29.4	58.6	27.7	54.7	31.0
19	53.2	29.9	57.7	29.4	55.4	29.8
20	54.3	26.9	58.5	28.1	56.0	30.8
21	52.2	30.2	58.1	28.1	56.1	29.3
22	51.8	30.7	56.5	27.8	* 55.4	* 29.3
23	53.4	29.1	55.2	28.9	54.6	29.3
24	52.2	30.4	57.2	26.7	55.1	28.1
25	54.7	30.7	52.9	28.8	55.0	29.3
26	52.3	30.3	51.4	30.7	52.5	31.1
27	52.9	29.8	53.6	30.7	51.6	28.8
28	57.0	28.2	56.1	31.0	53.3	29.9
29	56.7	27.8	56.3	30.7	* 52.9	* 30.4
30	54.1	29.0	56.1	31.0	52.4	31.0
31	56.7	27.8	53.6	31.0	0.0	0.0
MEANS	54.2	27.9	56.2	29.0	53.7	30.4
OBSVNS.	30	30	28	28	25	25
MAXIMUM	57.0	30.7	60.4	31.0	57.4	31.5
MINIMUM	51.4	22.6	51.4	26.1	50.0	28.1
STD.DEV.	1.77	2.29	2.11	1.43	1.86	.90

EGG ISLAND 51 15 06 N 127 49 53 W

	OCTOBER		NOVEMBER		DECEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.8	30.6	50.2	31.9	47.0	32.0
2	51.2	30.3	50.0	31.9	46.8	31.9
3	51.1	31.2	50.0	32.4	47.2	31.9
4	51.4	29.4	50.4	32.1	46.9	31.8
5	* 51.5	* 29.6	49.8	31.9	46.5	31.8
6	51.6	29.9	* 50.0	* 31.8	46.7	31.8
7	51.9	29.7	50.2	31.6	46.9	31.8
8	51.0	30.0	* 49.2	* 31.4	46.6	31.8
9	* 50.9	* 29.4	48.2	31.1	46.1	31.8
10	50.7	28.8	48.2	32.1	46.2	31.8
11	51.4	29.7	47.2	31.9	47.5	31.6
12	50.5	30.3	47.8	31.9	45.9	31.5
13	49.6	30.3	47.6	31.9	45.8	31.5
14	50.2	30.0	50.0	31.4	46.8	31.8
15	* 49.5	* 30.5	47.1	31.0	46.4	31.8
16	48.7	31.1	46.9	30.4	46.0	32.0
17	49.2	31.2	48.2	31.4	45.1	32.0
18	50.7	29.8	47.8	31.6	45.9	31.5
19	51.1	28.5	47.6	31.4	46.1	31.8
20	* 50.2	* 29.1	45.9	31.5	45.1	31.8
21	49.3	29.8	44.6	31.4	43.9	31.6
22	49.6	29.5	* 45.4	* 31.3	43.5	31.6
23	48.9	28.1	* 46.3	* 31.2	42.5	31.4
24	47.8	29.4	47.2	31.0	45.5	31.8
25	48.6	29.1	46.6	31.0	45.5	31.8
26	48.3	30.6	46.4	31.8	* 44.7	* 31.6
27	48.4	30.8	45.9	31.6	43.9	31.4
28	48.0	30.6	46.3	31.8	44.5	31.6
29	47.8	30.8	46.4	31.8	44.7	31.6
30	49.6	31.9	46.5	31.5	45.1	31.4
31	50.6	31.9	0.0	0.0	44.6	31.6
MEANS	50.0	30.1	47.8	31.6	45.7	31.7
OBSVNS.	27	27	26	26	30	30
YRLY.MEANS....................................					48.9	30.3
MAXIMUM	51.9	31.9	50.4	32.4	47.5	32.0
MINIMUM	47.8	28.1	44.6	30.4	42.5	31.4
STD.DEV.	1.32	.94	1.62	.44	1.21	.18

PINE ISLAND 50 58 33 N 127 43 35 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1974
1	45.8	30.7	43.8	30.7	44.8	29.8
2	45.0	30.7	43.5	30.7	44.5	29.9
3	44.0	30.7	43.8	30.7	44.0	30.2
4	44.2	31.0	44.0	30.7	43.8	30.0
5	44.2	31.5	44.0	31.1	44.0	30.7
6	44.3	31.5	44.3	31.1	43.5	30.4
7	44.5	31.4	44.6	30.8	43.5	31.0
8	44.5	31.0	44.6	31.1	* 43.5	* 30.7
9	44.5	31.6	44.6	31.0	43.5	30.4
10	44.5	31.1	44.6	31.1	44.0	30.3
11	43.8	31.2	44.5	30.8	44.5	30.7
12	43.8	31.2	44.4	30.7	44.3	30.4
13	44.2	30.8	43.8	30.6	44.3	30.8
14	44.5	30.6	44.3	30.7	44.5	30.8
15	44.5	31.0	44.2	31.0	44.3	30.6
16	44.8	30.7	44.8	31.0	44.5	30.6
17	44.5	30.8	44.0	31.0	44.5	30.6
18	* 44.5	* 31.0	44.5	31.2	44.2	30.3
19	44.5	31.2	44.5	31.4	44.2	30.8
20	44.2	31.0	44.8	31.6	44.5	30.8
21	43.8	30.4	44.8	31.4	44.5	31.0
22	44.2	30.4	44.8	30.6	44.3	30.8
23	44.2	31.0	44.6	30.7	44.5	31.0
24	44.5	30.4	44.0	29.0	44.6	31.1
25	44.3	30.4	44.5	30.0	44.6	30.7
26	44.2	30.6	44.8	30.2	44.7	30.6
27	44.6	30.6	44.8	30.2	44.8	30.4
28	44.4	30.4	44.5	30.3	44.8	30.4
29	44.4	30.6	0.0	0.0	45.0	30.6
30	43.6	30.4	0.0	0.0	45.5	30.4
31	43.8	30.6	0.0	0.0	45.7	30.4
MEANS	44.3	30.8	44.4	30.8	44.4	30.5
OBSVNS.	30	30	28	28	30	30
MAXIMUM	45.8	31.6	44.8	31.6	45.7	31.1
MINIMUM	43.6	30.4	43.5	29.0	43.5	29.8
STD.DEV.	.42	.37	.37	.51	.50	.32

PINE ISLAND 50 58 33 N 127 43 35 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.5	30.7	45.5	30.4	47.2	31.2
2	45.6	30.6	45.8	31.1	47.3	31.0
3	45.2	30.7	46.0	30.8	47.0	31.4
4	46.0	30.8	46.0	30.8	47.4	31.1
5	45.5	30.8	46.2	31.1	47.3	31.1
6	45.0	30.7	46.4	30.8	47.3	31.2
7	45.5	30.4	46.4	30.8	47.7	31.0
8	45.7	30.3	46.0	31.0	48.2	31.1
9	46.3	30.4	46.4	30.6	47.6	31.2
10	46.0	30.3	46.3	30.6	47.8	31.0
11	45.3	30.3	46.8	30.6	48.0	31.1
12	45.7	30.4	46.9	30.6	48.4	31.2
13	45.3	30.3	46.2	30.4	48.6	30.8
14	46.0	30.4	46.6	30.8	48.5	30.6
15	45.2	30.6	46.2	30.8	48.0	30.7
16	45.0	30.2	46.0	30.8	48.5	31.4
17	45.2	30.7	46.2	30.8	47.5	31.2
18	45.0	30.8	46.5	30.6	47.8	31.4
19	45.0	30.6	46.5	31.2	48.6	31.5
20	45.2	30.6	47.4	30.7	48.5	31.4
21	45.2	30.7	47.5	30.7	48.0	31.1
22	45.7	30.6	47.0	30.6	48.8	31.0
23	45.7	30.7	47.2	31.0	49.0	31.0
24	46.0	30.6	47.4	31.0	48.8	31.4
25	45.7	30.6	47.2	31.0	48.5	31.2
26	46.0	30.4	47.7	31.2	48.0	31.0
27	46.0	30.6	47.7	31.0	48.0	31.1
28	46.0	30.6	47.3	31.1	47.6	31.2
29	46.2	30.3	47.3	31.2	48.0	31.2
30	45.6	30.4	47.2	31.2	47.8	32.0
31	0.0	0.0	47.6	31.2	0.0	0.0
MEANS	45.6	30.5	46.7	30.9	48.0	31.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	46.3	30.8	47.7	31.2	49.0	32.0
MINIMUM	45.0	30.2	45.5	30.4	47.0	30.6
STD.DEV.	.39	.18	.63	.24	.54	.26

PINE ISLAND 50 58 33 N 127 43 35 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	48.8	31.5	48.8	31.8	49.1	31.6
2	47.8	31.5	50.2	31.1	49.3	31.4
3	48.4	31.1	50.4	31.1	49.6	31.2
4	48.8	31.1	49.5	31.8	49.1	31.2
5	49.0	31.0	50.0	31.8	48.9	31.2
6	48.3	31.2	49.8	31.6	48.9	31.6
7	49.0	31.0	50.5	31.5	49.5	31.4
8	49.5	30.8	49.5	31.8	49.6	31.5
9	48.7	30.8	50.5	31.5	49.3	31.0
10	49.8	30.7	50.0	31.6	49.8	31.2
11	48.3	30.6	51.0	31.1	50.4	31.1
12	49.5	30.6	49.5	31.4	50.9	31.2
13	47.8	30.7	49.0	31.5	50.6	31.1
14	49.0	30.7	50.2	30.8	50.3	31.2
15	49.4	30.7	50.0	31.2	50.0	31.1
16	49.0	31.8	50.0	31.6	49.2	31.4
17	48.6	31.2	49.4	31.8	48.7	31.6
18	48.6	31.2	49.5	31.6	48.4	31.6
19	48.6	30.7	49.0	31.4	49.0	31.9
20	49.0	31.5	48.8	31.6	49.4	31.8
21	48.3	31.0	48.3	32.4	49.8	31.9
22	48.4	31.2	48.1	31.8	49.3	31.5
23	48.6	31.6	48.8	31.4	49.1	31.2
24	48.5	31.5	48.5	31.4	49.3	31.2
25	48.8	31.5	47.6	31.2	49.1	31.2
26	48.2	31.8	48.0	31.4	48.5	31.2
27	48.5	31.0	49.5	30.6	48.4	31.4
28	48.6	31.2	49.4	30.3	48.2	31.4
29	50.0	31.6	49.7	30.3	48.5	31.2
30	49.5	31.6	49.8	30.8	48.0	31.2
31	49.2	31.6	49.8	31.0	0.0	0.0
MEANS	48.8	31.2	49.5	31.4	49.3	31.4
OBSVNS.	31	31	31	31	30	30
MAXIMUM	50.0	31.8	51.0	32.4	50.9	31.9
MINIMUM	47.8	30.6	47.6	30.3	48.0	31.0
STD.DEV.	.53	.38	.81	.46	.70	.25

PINE ISLAND 50 58 33 N 127 43 35 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	48.4	31.1	48.0	31.4	46.7	31.2
2	47.9	31.2	47.7	31.2	46.5	31.2
3	47.8	31.0	47.0	31.5	46.8	31.2
4	47.5	31.4	46.8	31.6	46.5	31.1
5	47.5	31.8	47.4	31.5	47.5	31.2
6	47.2	31.5	48.8	31.5	47.0	31.9
7	47.8	31.8	48.5	31.5	47.0	31.5
8	47.8	31.8	49.0	31.8	46.5	31.2
9	47.5	31.5	49.0	31.4	46.2	31.1
10	47.4	31.4	49.2	31.6	46.6	31.2
11	47.6	31.2	49.1	31.4	46.8	31.2
12	47.6	31.5	49.1	31.5	46.2	31.1
13	48.1	31.5	48.5	31.2	46.5	31.2
14	48.5	31.5	48.0	31.8	* 46.5	* 31.2
15	48.3	31.6	47.5	31.5	46.4	31.1
16	47.7	31.2	47.3	31.6	46.5	31.2
17	47.5	31.5	46.8	31.1	46.0	31.1
18	48.2	31.9	46.8	31.6	47.0	31.2
19	47.8	31.9	47.2	31.6	46.8	31.4
20	48.0	31.8	47.0	31.6	46.8	31.2
21	48.0	31.5	47.0	31.6	45.8	31.4
22	48.2	31.8	47.0	31.8	45.5	31.4
23	48.2	31.6	46.4	31.4	45.8	31.2
24	48.4	31.8	47.3	31.4	45.4	31.0
25	49.3	31.5	46.7	31.4	45.7	31.0
26	47.8	31.5	46.4	31.4	45.7	31.2
27	47.4	31.2	47.0	31.5	45.5	31.1
28	49.8	31.5	47.2	31.4	45.7	31.1
29	48.2	31.2	47.1	31.4	45.8	30.8
30	47.6	31.1	46.8	31.2	45.5	31.1
31	48.0	31.5	0.0	0.0	45.6	30.8
MEANS	48.0	31.5	47.6	31.5	46.3	31.2
OBSVNS.	31	31	30	30	30	30
YRLY.MEANS....................................					46.9	31.1
MAXIMUM	49.8	31.9	49.2	31.8	47.5	31.9
MINIMUM	47.2	31.0	46.4	31.1	45.4	30.8
STD.DEV.	.54	.25	.89	.17	.57	.20

KAINS ISLAND 50 26 39 N 128 01 47 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.3	29.3	45.2	28.4	44.8	28.1
2	41.5	28.9	45.0	28.6	44.6	28.4
3	41.6	29.3	45.4	29.1	44.8	28.9
4	42.5	29.5	45.0	27.6	45.2	29.0
5	41.7	29.4	45.0	27.8	45.3	29.5
6	42.8	29.8	45.4	27.7	41.2	28.6
7	41.2	29.5	45.8	29.3	39.4	28.0
8	41.5	29.5	45.5	27.8	* 42.4	* 28.8
9	42.6	29.7	45.6	29.0	45.4	29.7
10	42.4	30.2	45.5	29.1	44.6	29.0
11	42.6	30.4	46.0	29.8	45.2	27.6
12	42.8	30.6	45.5	29.7	45.4	28.1
13	43.2	30.2	45.5	29.9	44.9	28.6
14	42.6	30.4	45.4	28.5	44.8	28.6
15	43.0	28.8	45.8	27.7	45.1	29.0
16	42.8	29.0	45.6	28.4	45.2	28.8
17	43.0	29.5	45.2	28.4	45.6	27.1
18	44.2	29.3	45.5	29.0	45.4	26.4
19	43.8	29.5	45.2	28.4	46.2	28.6
20	42.0	29.0	45.4	30.2	46.8	28.6
21	43.5	29.0	45.0	28.9	45.4	28.9
22	45.0	29.0	44.8	28.9	45.6	29.1
23	45.8	29.0	44.6	28.9	45.6	29.3
24	45.5	27.2	45.0	29.0	45.6	29.9
25	45.5	27.7	44.5	28.1	46.3	30.0
26	45.5	27.7	42.8	25.0	47.1	30.0
27	45.5	26.4	43.8	26.3	47.3	29.7
28	45.4	27.7	44.0	27.6	47.0	29.9
29	45.5	28.9	0.0	0.0	47.0	29.3
30	44.8	27.2	0.0	0.0	46.3	29.3
31	45.4	28.6	0.0	0.0	46.1	28.9
MEANS	43.5	29.0	45.1	28.5	45.3	28.8
OBSVNS.	31	31	28	28	30	30
MAXIMUM	45.8	30.6	46.0	30.2	47.3	30.0
MINIMUM	41.2	26.4	42.8	25.0	39.4	26.4
STD.DEV.	1.50	1.01	.68	1.08	1.58	.84

KAINS ISLAND 50 26 39 N 128 01 47 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.3	27.7	48.8	29.4	49.8	30.3
2	46.7	28.1	49.0	29.3	50.8	30.8
3	46.7	28.2	48.7	29.8	49.6	30.6
4	46.0	28.5	49.7	30.2	51.2	30.3
5	46.7	28.8	49.3	30.0	51.8	30.2
6	46.8	29.1	48.9	29.7	52.2	30.7
7	47.2	28.8	49.2	29.7	51.4	30.7
8	46.4	27.8	48.8	29.5	51.8	30.7
9	46.5	26.5	49.9	29.4	51.8	30.8
10	46.4	29.1	49.1	29.3	51.4	30.6
11	46.6	28.6	49.1	28.8	51.8	30.4
12	47.2	28.6	49.2	30.0	52.6	30.8
13	47.7	28.6	47.8	29.9	52.5	30.8
14	48.2	28.2	48.2	29.8	52.3	31.0
15	47.7	28.8	48.9	29.5	51.2	31.1
16	47.7	28.9	49.2	29.4	53.2	31.1
17	47.9	28.6	50.1	29.4	52.2	31.1
18	46.8	29.1	50.2	29.4	51.8	31.2
19	47.2	28.8	51.2	29.1	51.8	31.4
20	47.0	29.3	50.8	30.4	51.6	31.5
21	46.8	29.7	49.7	30.6	49.6	31.8
22	47.1	28.6	52.0	30.4	52.1	31.9
23	47.8	28.8	50.7	29.7	52.3	31.6
24	49.6	29.3	52.1	30.4	52.4	31.8
25	49.6	29.5	50.2	30.6	51.8	31.8
26	49.1	29.5	51.1	30.4	* 51.6	* 31.9
27	49.0	29.8	51.5	29.3	51.3	32.0
28	49.2	29.9	50.8	30.2	50.4	31.6
29	48.8	29.8	50.8	30.3	50.9	31.4
30	48.2	30.0	51.4	30.3	52.2	31.6
31	0.0	0.0	49.8	30.8	0.0	0.0
MEANS	47.5	28.9	49.9	29.8	51.6	31.1
OBSVNS.	30	30	31	31	29	29
MAXIMUM	49.6	30.0	52.1	30.8	53.2	32.0
MINIMUM	46.0	27.7	47.8	28.8	49.6	30.2
STD.DEV.	1.04	.61	1.12	.51	.88	.53

KAINS ISLAND 50 26 39 N 128 01 47 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.3	31.6	54.5	31.6	58.2	32.3
2	52.0	31.5	54.8	31.9	59.1	31.4
3	50.4	31.8	54.5	31.9	58.2	31.2
4	52.6	31.8	53.6	32.0	57.9	31.5
5	52.7	31.1	52.8	32.1	57.3	32.0
6	53.4	31.6	53.7	31.9	58.2	32.3
7	52.6	31.6	53.8	32.1	58.3	32.1
8	52.3	31.6	53.2	32.0	57.8	31.5
9	52.8	31.9	54.4	32.0	57.2	32.0
10	53.6	31.4	53.2	32.3	58.3	31.8
11	53.7	31.1	53.8	32.7	* 57.8	* 31.5
12	54.9	30.6	52.7	32.4	57.3	31.2
13	56.2	31.0	51.4	32.7	58.3	31.8
14	56.2	31.9	52.3	32.9	56.8	32.0
15	56.1	32.3	54.6	32.5	57.9	32.3
16	55.1	31.9	52.8	32.9	57.7	32.0
17	54.9	31.8	54.6	32.7	59.1	31.9
18	56.4	31.0	54.4	32.9	57.3	32.1
19	56.6	31.2	54.6	32.7	56.7	32.1
20	59.4	31.4	54.3	32.4	57.3	32.3
21	56.5	31.2	54.8	32.5	57.6	32.3
22	56.4	31.0	55.2	32.0	57.4	32.1
23	57.0	31.4	55.7	31.4	57.2	31.6
24	56.8	31.6	56.2	32.0	56.9	32.1
25	57.5	31.4	56.4	32.0	55.8	32.3
26	57.3	31.4	56.8	32.4	54.8	32.3
27	57.6	31.6	56.8	32.4	52.9	32.1
28	56.8	31.5	56.7	32.4	52.8	32.4
29	55.6	31.2	58.6	32.4	51.7	32.3
30	53.7	31.4	57.8	32.3	51.8	32.3
31	54.1	31.8	57.2	32.1	0.0	0.0
MEANS	54.9	31.5	54.7	32.3	56.8	32.0
OBSVNS.	31	31	31	31	29	29
MAXIMUM	59.4	32.3	58.6	32.9	59.1	32.4
MINIMUM	50.4	30.6	51.4	31.4	51.7	31.2
STD.DEV.	2.18	.35	1.70	.38	2.04	.35

KAINS ISLAND 50 26 39 N 128 01 47 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.8	32.0	51.1	31.8	47.3	30.4
2	51.7	32.1	50.7	31.9	47.9	31.0
3	51.8	32.3	50.7	32.0	47.8	30.8
4	51.7	32.3	50.7	31.9	48.1	31.0
5	51.8	31.9	50.6	31.8	47.7	29.7
6	51.7	32.3	50.6	31.5	48.1	29.9
7	52.9	32.4	49.7	31.6	48.2	30.6
8	53.4	32.3	50.1	31.5	48.1	30.4
9	52.3	31.9	49.7	30.4	47.9	30.2
10	52.3	31.9	48.7	28.8	47.4	29.0
11	53.3	32.0	48.8	30.7	47.4	29.8
12	52.8	32.0	48.8	30.3	47.3	30.0
13	52.2	32.0	49.3	29.8	47.4	29.8
14	52.6	31.8	49.0	31.0	47.8	31.0
15	52.9	32.1	49.2	31.2	47.2	29.0
16	52.9	31.8	49.2	31.1	47.8	29.8
17	53.2	31.9	49.0	31.6	47.0	29.5
18	54.0	30.2	48.8	31.8	47.7	30.6
19	53.4	31.9	47.8	30.4	47.4	28.6
20	52.5	31.6	46.8	29.9	46.7	27.4
21	51.9	31.8	46.7	30.0	46.3	28.9
22	51.7	31.8	47.4	30.6	45.6	27.6
23	52.4	31.5	47.6	30.4	46.4	28.1
24	51.6	31.6	47.2	29.0	46.8	28.2
25	51.4	31.5	46.9	29.4	46.7	29.0
26	52.3	31.8	46.8	29.9	45.6	28.4
27	52.0	31.9	46.8	29.7	46.7	28.6
28	51.4	31.9	46.7	29.4	46.8	29.3
29	51.2	31.2	47.3	29.9	46.4	28.6
30	51.3	31.9	47.0	30.3	45.6	27.3
31	51.4	31.5	0.0	0.0	45.7	28.1
MEANS	52.3	31.8	48.7	30.7	47.1	29.4
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS....................................					49.8	30.3
MAXIMUM	54.0	32.4	51.1	32.0	48.2	31.0
MINIMUM	51.2	30.2	46.7	28.8	45.6	27.3
STD.DEV.	.73	.41	1.47	.95	.80	1.10

AMPHITRITE POINT 48 55 16 N 125 32 17 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1974
1	45.2	28.6	47.1	30.4	45.2	27.2
2	43.3	26.8	46.3	26.8	44.7	27.1
3	42.4	27.8	46.7	26.1	44.4	27.2
4	43.7	28.2	46.8	28.9	45.0	26.5
5	42.9	28.6	46.0	28.2	45.9	28.0
6	43.4	28.9	46.0	27.8	45.2	29.3
7	43.3	29.1	45.3	26.3	46.2	29.5
8	44.0	29.3	45.2	24.3	* 45.9	* 29.2
9	44.1	29.3	45.0	23.5	* 45.6	* 28.9
10	44.0	29.4	45.1	25.9	45.3	28.6
11	44.4	29.7	44.9	25.8	45.2	27.4
12	45.6	29.9	45.0	22.9	44.9	26.3
13	46.9	30.0	* 45.3	* 24.8	45.2	29.4
14	47.3	30.8	45.6	26.8	44.3	26.4
15	* 47.0	* 30.8	45.7	27.8	45.1	24.7
16	46.8	30.8	45.4	27.8	* 45.1	* 25.1
17	45.9	30.3	45.3	27.6	45.2	25.6
18	* 46.1	* 30.2	45.3	26.8	45.4	25.9
19	46.3	30.2	46.1	27.3	46.6	27.3
20	46.1	28.8	45.6	27.6	46.9	26.3
21	45.3	23.7	46.4	28.6	47.1	26.5
22	45.5	24.3	46.3	28.1	47.0	26.8
23	46.2	25.1	* 45.5	* 26.5	46.4	26.9
24	46.3	21.7	44.7	25.0	47.3	27.7
25	47.2	29.1	44.6	24.7	46.8	27.2
26	46.0	27.4	44.9	25.0	* 46.8	* 27.5
27	46.4	26.5	44.4	25.0	46.8	27.8
28	46.6	27.4	* 44.8	* 26.1	46.6	28.0
29	46.3	28.0	0.0	0.0	46.7	27.3
30	45.0	27.7	0.0	0.0	46.7	27.2
31	45.1	27.1	0.0	0.0	46.6	27.4
MEANS	45.2	28.1	45.6	26.6	45.9	27.2
OBSVNS.	29	29	25	25	27	27
MAXIMUM	47.3	30.8	47.1	30.4	47.3	29.5
MINIMUM	42.4	21.7	44.4	22.9	44.3	24.7
STD.DEV.	1.40	2.17	.73	1.79	.92	1.12

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.8	25.1	49.4	29.5	51.5	29.5
2	47.0	26.0	48.7	29.7	51.1	29.4
3	47.1	27.6	49.8	29.1	50.8	28.9
4	46.7	24.8	49.9	29.3	50.9	28.4
5	* 47.2	* 26.4	49.8	29.1	51.3	29.0
6	47.7	28.1	50.5	29.7	51.1	29.1
7	48.3	26.9	48.7	29.4	51.4	30.0
8	48.0	24.8	49.7	29.9	50.3	30.7
9	48.4	28.1	49.0	28.0	51.7	30.3
10	* 48.3	* 28.3	49.6	29.0	51.8	30.2
11	48.2	28.6	49.6	30.2	49.9	31.1
12	48.5	27.8	48.7	31.4	50.0	31.1
13	47.4	27.6	48.8	29.8	51.8	30.3
14	48.4	26.9	47.8	28.4	51.0	30.2
15	48.9	26.5	48.0	29.9	50.8	30.6
16	47.5	29.1	48.4	29.3	49.5	31.2
17	47.9	29.0	49.3	29.0	50.6	30.4
18	47.7	29.8	49.9	29.3	54.3	29.3
19	47.8	29.8	50.6	29.1	55.1	29.5
20	47.8	30.0	51.0	29.0	55.1	29.7
21	48.0	28.6	51.4	28.8	54.0	29.7
22	48.0	27.8	* 50.4	* 26.9	49.3	31.4
23	48.8	28.9	49.4	25.0	50.1	31.8
24	49.1	29.0	49.7	25.1	50.6	31.8
25	49.6	28.2	49.8	25.2	50.2	31.8
26	49.8	28.6	51.3	28.2	51.2	30.4
27	48.4	30.6	52.6	28.6	51.3	29.8
28	49.0	30.2	52.7	28.6	51.2	30.4
29	49.8	29.5	52.8	28.9	51.2	30.6
30	48.7	30.3	51.2	29.8	51.0	31.1
31	0.0	0.0	51.4	29.5	0.0	0.0
MEANS	48.2	28.1	50.0	28.9	51.3	30.3
OBSVNS.	28	28	30	30	30	30
MAXIMUM	49.8	30.6	52.8	31.4	55.1	31.8
MINIMUM	46.7	24.8	47.8	25.0	49.3	28.4
STD.DEV.	.84	1.63	1.33	1.43	1.47	.91

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.4	30.4	56.5	30.3	56.6	30.3
2	54.0	30.3	54.8	30.2	57.5	30.4
3	53.4	26.5	58.0	30.0	58.8	30.3
4	52.6	29.8	58.5	29.9	56.6	30.7
5	53.7	29.8	59.2	29.1	57.0	30.7
6	54.1	30.3	57.4	30.0	58.3	30.7
7	54.3	30.7	57.2	30.2	56.9	31.0
8	55.4	30.6	57.5	30.2	57.6	28.6
9	* 53.8	* 29.9	58.5	30.0	54.0	26.3
10	52.2	29.3	57.4	30.2	53.9	30.0
11	55.4	29.1	57.8	30.0	55.2	30.2
12	56.3	30.7	59.4	29.5	55.7	29.9
13	56.7	29.3	57.0	30.4	55.9	29.4
14	57.0	28.6	57.9	29.7	57.4	29.3
15	55.0	26.9	58.0	29.5	56.3	29.9
16	55.2	27.4	56.4	29.9	57.0	29.9
17	55.4	28.9	56.8	29.8	55.7	30.2
18	55.7	28.2	57.0	29.7	57.7	29.9
19	56.4	29.3	56.5	29.8	56.8	30.3
20	57.4	28.6	56.6	29.9	59.6	30.0
21	57.0	28.1	57.5	29.9	57.2	30.3
22	58.2	28.1	57.5	29.5	57.7	30.4
23	57.4	29.1	57.5	29.7	57.4	30.3
24	57.5	30.2	58.0	29.9	57.8	30.4
25	56.8	29.3	56.0	30.2	57.0	30.2
26	56.6	29.9	54.8	30.3	52.1	31.0
27	56.4	30.0	56.1	30.0	53.3	31.1
28	53.4	29.8	55.7	30.2	52.0	31.2
29	55.0	30.6	56.8	30.0	52.9	31.0
30	55.0	30.4	57.4	30.3	54.2	30.7
31	57.7	29.9	56.5	29.7	0.0	0.0
MEANS	55.4	29.3	57.2	29.9	56.2	30.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	58.2	30.7	59.4	30.4	59.6	31.2
MINIMUM	51.4	26.5	54.8	29.1	52.0	26.3
STD.DEV.	1.75	1.13	1.08	.29	1.95	.92

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.9	30.3	49.9	31.2	48.5	28.2
2	52.8	30.0	49.8	30.8	48.9	28.6
3	52.9	30.6	49.7	31.0	48.9	28.5
4	52.6	30.7	49.2	30.6	49.2	28.0
5	53.0	30.3	48.4	30.8	48.3	26.1
6	53.2	30.8	49.2	30.8	48.8	27.6
7	53.3	30.6	49.2	30.6	49.3	29.9
8	53.9	30.4	49.1	29.7	48.7	27.1
9	53.3	30.3	48.6	29.5	49.3	29.4
10	52.8	26.5	49.7	31.1	49.2	28.2
11	52.3	29.0	48.9	28.6	49.6	30.0
12	52.1	30.2	49.8	28.9	47.3	26.4
13	53.2	29.7	49.8	28.6	49.4	30.8
14	52.3	29.9	50.3	29.3	49.3	29.9
15	52.7	29.9	49.4	28.4	48.0	26.9
16	52.3	30.6	49.8	28.9	48.5	22.6
17	52.5	30.3	49.7	28.8	48.7	29.5
18	52.4	30.8	* 49.2	* 28.0	49.3	29.3
19	52.3	30.4	48.7	27.2	48.9	29.5
20	51.3	30.8	48.6	26.0	48.7	24.2
21	52.0	30.2	48.4	29.4	48.6	29.7
22	51.9	30.6	48.7	27.7	48.4	29.9
23	50.4	31.0	48.3	28.5	45.7	25.9
24	51.3	31.1	* 48.9	29.6	46.2	25.1
25	51.3	30.8	49.6	30.7	48.7	29.8
26	50.7	31.5	47.6	26.4	47.3	26.0
27	51.2	30.4	47.4	27.7	47.1	28.1
28	50.0	31.0	47.5	28.1	47.1	28.9
29	49.7	31.0	48.4	28.8	47.4	24.7
30	50.3	29.8	48.3	28.4	48.8	29.9
31	50.3	31.1	0.0	0.0	46.3	27.3
MEANS	52.1	30.3	49.0	29.2	48.3	27.9
OBSVNS.	31	31	28	29	31	31
YRLY.MEANS....................................					50.5	28.9
MAXIMUM	53.9	31.5	50.3	31.2	49.6	30.8
MINIMUM	49.7	26.5	47.4	26.0	45.7	22.6
STD.DEV.	1.15	.87	.78	1.41	1.03	2.02

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	* 0.0	* 45.3	* 0.0	45.7	* 0.0
2	45.7	* 0.0	45.5	* 0.0	45.7	* 0.0
3	45.6	* 0.0	45.0	* 0.0	45.1	* 0.0
4	45.4	* 0.0	45.0	* 0.0	44.5	* 0.0
5	45.4	* 0.0	45.5	* 0.0	44.3	* 0.0
6	43.9	* 0.0	45.3	* 0.0	44.0	* 0.0
7	44.0	* 0.0	45.3	* 0.0	44.0	* 0.0
8	44.5	* 0.0	45.2	* 0.0	44.5	* 0.0
9	44.5	* 0.0	45.2	* 0.0	44.7	* 0.0
10	45.4	* 0.0	45.3	* 0.0	44.2	* 0.0
11	44.5	* 0.0	45.2	* 0.0	44.7	* 0.0
12	45.4	* 0.0	45.2	* 0.0	44.9	* 0.0
13	45.4	* 0.0	45.2	* 0.0	45.1	* 0.0
14	45.5	* 0.0	45.1	* 0.0	45.1	* 0.0
15	45.3	* 0.0	45.4	* 0.0	45.1	* 0.0
16	45.4	* 0.0	44.9	* 0.0	45.1	* 0.0
17	* 45.4	* 0.0	* 45.2	* 0.0	45.2	* 0.0
18	45.3	* 0.0	45.5	* 0.0	45.1	* 0.0
19	* 45.3	* 0.0	45.5	* 0.0	45.0	* 0.0
20	45.3	* 0.0	45.4	* 0.0	44.8	* 0.0
21	45.0	* 0.0	45.5	* 0.0	44.9	* 0.0
22	45.1	* 0.0	45.6	* 0.0	44.9	* 0.0
23	45.5	* 0.0	45.1	* 0.0	46.1	* 0.0
24	45.5	* 0.0	44.8	* 0.0	46.2	* 0.0
25	45.9	* 0.0	45.0	* 0.0	45.8	* 0.0
26	45.4	* 0.0	45.5	* 0.0	45.6	* 0.0
27	45.5	* 0.0	45.0	* 0.0	46.0	* 0.0
28	45.5	* 0.0	45.0	* 0.0	45.8	* 0.0
29	45.4	* 0.0	0.0	0.0	45.8	* 0.0
30	45.0	* 0.0	0.0	0.0	46.0	* 0.0
31	45.1	* 0.0	0.0	0.0	45.3	* 0.0
MEANS	45.2	0.0	45.2	0.0	45.1	0.0
OBSVNS.	29	0	26	0	31	0
MAXIMUM	45.9	0.0	45.6	0.0	46.2	0.0
MINIMUM	43.9	0.0	44.8	0.0	44.0	0.0
STD.DEV.	.49	0.00	.22	0.00	.62	0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.7	* 0.0	46.7	* 0.0	48.1	* 0.0
2	45.3	* 0.0	47.0	* 0.0	48.0	* 0.0
3	46.4	* 0.0	47.2	* 0.0	48.1	* 0.0
4	46.4	* 0.0	47.8	* 0.0	48.1	* 0.0
5	46.3	* 0.0	47.7	* 0.0	48.2	* 0.0
6	46.4	* 0.0	47.8	* 0.0	48.2	* 0.0
7	46.5	* 0.0	48.0	* 0.0	48.3	* 0.0
8	46.5	* 0.0	47.9	* 0.0	48.2	* 0.0
9	46.4	* 0.0	48.1	* 0.0	49.4	* 0.0
10	46.3	* 0.0	47.8	* 0.0	49.3	* 0.0
11	46.4	* 0.0	47.7	* 0.0	48.4	* 0.0
12	* 46.4	* 0.0	47.7	* 0.0	48.9	* 0.0
13	46.5	* 0.0	47.2	* 0.0	48.9	* 0.0
14	47.5	* 0.0	47.4	* 0.0	48.8	* 0.0
15	46.9	* 0.0	47.4	* 0.0	48.9	* 0.0
16	46.9	* 0.0	47.5	* 0.0	49.8	* 0.0
17	47.3	* 0.0	47.3	* 0.0	49.9	* 0.0
18	47.1	* 0.0	47.4	* 0.0	52.5	* 0.0
19	47.3	* 0.0	48.2	* 0.0	51.5	* 0.0
20	47.3	* 0.0	47.4	* 0.0	50.2	* 0.0
21	46.8	* 0.0	48.5	* 0.0	50.0	* 0.0
22	46.7	* 0.0	48.0	* 0.0	49.7	* 0.0
23	47.2	* 0.0	47.5	* 0.0	* 49.4	* 0.0
24	47.0	* 0.0	47.2	* 0.0	49.1	* 0.0
25	47.5	* 0.0	47.5	* 0.0	49.2	* 0.0
26	46.8	* 0.0	47.5	* 0.0	49.1	* 0.0
27	46.5	* 0.0	47.6	* 0.0	49.1	* 0.0
28	46.6	* 0.0	48.1	* 0.0	49.1	* 0.0
29	* 46.7	* 0.0	48.0	* 0.0	49.0	* 0.0
30	46.9	* 0.0	47.5	* 0.0	49.0	* 0.0
31	0.0	0.0	48.5	* 0.0	0.0	0.0
MEANS	46.7	0.0	47.6	0.0	49.1	0.0
OBSVNS.	28	0	31	0	29	0
MAXIMUM	47.5	0.0	48.5	0.0	52.5	0.0
MINIMUM	45.3	0.0	46.7	0.0	48.0	0.0
STD.DEV.	.47	0.00	.41	0.00	1.02	0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1974 TEMP	SEPTEMBER 1974 SAL
1	49.0	* 0.0	54.6	* 0.0	48.4	* 0.0
2	49.1	* 0.0	53.4	* 0.0	52.6	* 0.0
3	49.2	* 0.0	52.4	* 0.0	52.5	* 0.0
4	49.3	* 0.0	53.5	* 0.0	51.0	* 0.0
5	49.4	* 0.0	52.0	* 0.0	51.5	* 0.0
6	49.4	* 0.0	52.3	* 0.0	51.5	* 0.0
7	49.4	* 0.0	53.5	* 0.0	52.8	* 0.0
8	49.6	* 0.0	51.6	* 0.0	* 51.8	* 0.0
9	49.6	* 0.0	53.6	* 0.0	50.8	* 0.0
10	50.3	* 0.0	53.5	* 0.0	51.1	* 0.0
11	50.1	* 0.0	52.9	* 0.0	50.9	* 0.0
12	49.4	* 0.0	52.3	* 0.0	50.8	* 0.0
13	49.6	* 0.0	* 52.1	* 0.0	50.8	* 0.0
14	49.3	* 0.0	51.8	* 0.0	50.9	* 0.0
15	49.6	* 0.0	53.6	* 0.0	50.7	* 0.0
16	50.6	* 0.0	51.8	* 0.0	50.7	* 0.0
17	50.5	* 0.0	49.8	* 0.0	50.6	* 0.0
18	50.0	* 0.0	51.8	* 0.0	50.3	* 0.0
19	49.6	* 0.0	51.6	* 0.0	50.1	* 0.0
20	50.3	* 0.0	51.7	* 0.0	50.1	* 0.0
21	50.6	* 0.0	51.9	* 0.0	49.9	* 0.0
22	49.6	* 0.0	51.8	* 0.0	50.1	* 0.0
23	49.8	* 0.0	51.3	* 0.0	49.8	* 0.0
24	50.2	* 0.0	51.1	* 0.0	49.6	* 0.0
25	49.8	* 0.0	49.8	* 0.0	49.6	* 0.0
26	51.0	* 0.0	49.8	* 0.0	49.2	* 0.0
27	51.3	* 0.0	49.0	* 0.0	49.4	* 0.0
28	51.6	* 0.0	48.8	* 0.0	49.7	* 0.0
29	53.4	* 0.0	48.6	* 0.0	51.5	* 0.0
30	54.2	* 0.0	48.8	* 0.0	51.0	* 0.0
31	55.4	* 0.0	48.4	* 0.0	0.0	0.0
MEANS	50.3	0.0	51.6	0.0	50.6	0.0
OBSVNS.	31	0	30	0	29	0
MAXIMUM	55.4	0.0	54.6	0.0	52.8	0.0
MINIMUM	49.0	0.0	48.4	0.0	48.4	0.0
STD.DEV.	1.50	0.00	1.73	0.00	1.01	0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.8	* 0.0	47.3	* 0.0	47.2	* 0.0
2	51.8	* 0.0	47.4	* 0.0	47.6	* 0.0
3	51.0	* 0.0	47.8	* 0.0	47.4	* 0.0
4	50.0	* 0.0	47.7	* 0.0	47.3	* 0.0
5	50.0	* 0.0	47.5	* 0.0	47.2	* 0.0
6	49.8	* 0.0	47.5	* 0.0	47.3	* 0.0
7	49.6	* 0.0	47.4	* 0.0	47.2	* 0.0
8	49.6	* 0.0	47.3	* 0.0	47.3	* 0.0
9	49.5	* 0.0	47.2	* 0.0	47.3	* 0.0
10	49.5	* 0.0	47.3	* 0.0	47.5	* 0.0
11	49.4	* 0.0	47.3	* 0.0	47.5	* 0.0
12	49.5	* 0.0	47.3	* 0.0	47.4	* 0.0
13	* 49.5	* 0.0	47.4	* 0.0	47.5	* 0.0
14	49.5	* 0.0	47.3	* 0.0	47.5	* 0.0
15	49.4	* 0.0	47.4	* 0.0	47.3	* 0.0
16	49.1	* 0.0	47.3	* 0.0	* 47.3	* 0.0
17	48.7	* 0.0	47.4	* 0.0	47.2	* 0.0
18	48.7	* 0.0	47.3	* 0.0	47.3	* 0.0
19	48.6	* 0.0	47.2	* 0.0	47.2	* 0.0
20	48.6	* 0.0	47.2	* 0.0	47.2	* 0.0
21	48.4	* 0.0	47.1	* 0.0	47.0	* 0.0
22	48.5	* 0.0	47.0	* 0.0	47.1	* 0.0
23	48.4	* 0.0	47.1	* 0.0	47.1	* 0.0
24	48.4	* 0.0	47.0	* 0.0	47.2	* 0.0
25	49.0	* 0.0	47.2	* 0.0	47.2	* 0.0
26	48.6	* 0.0	* 47.2	* 0.0	47.1	* 0.0
27	48.1	* 0.0	47.3	* 0.0	47.1	* 0.0
28	47.8	* 0.0	47.2	* 0.0	47.1	* 0.0
29	47.8	* 0.0	47.3	* 0.0	47.0	* 0.0
30	47.8	* 0.0	47.2	* 0.0	46.8	* 0.0
31	47.4	* 0.0	0.0	0.0	46.5	* 0.0
MEANS	49.2	0.0	47.3	0.0	47.2	0.0
OBSVNS.	30	0	29	0	30	0
YRLY.MEANS....................................					48.0	0.0
MAXIMUM	52.8	0.0	47.8	0.0	47.6	0.0
MINIMUM	47.4	0.0	47.0	0.0	46.5	0.0
STD.DEV.	1.17	0.00	.18	0.00	.22	0.00

RACE ROCKS 48 17 57 N 123 31 48 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.1	30.8	45.0	31.1	44.7	31.2
2	* 45.1	* 30.7	45.0	30.8	44.5	30.8
3	45.0	30.6	45.1	30.7	44.5	30.7
4	44.8	30.6	45.2	30.7	44.8	30.8
5	44.7	30.7	45.2	30.7	44.7	31.0
6	44.4	30.7	45.0	30.7	44.3	31.2
7	44.8	30.8	45.3	30.7	44.5	31.1
8	45.0	31.1	45.5	30.6	44.6	31.5
9	45.0	31.1	45.2	30.8	44.9	31.5
10	45.1	31.5	45.0	30.7	45.2	31.9
11	45.0	31.2	45.1	30.8	45.5	31.6
12	44.1	31.5	45.0	31.1	45.0	30.8
13	45.2	32.0	44.9	30.7	44.6	31.2
14	45.1	31.8	44.8	31.1	44.9	30.8
15	45.6	31.4	44.8	30.8	45.0	30.7
16	45.5	31.0	45.0	31.0	45.1	30.6
17	44.9	31.4	45.0	31.2	44.9	30.6
18	44.4	30.8	45.0	31.2	44.7	30.7
19	45.1	31.1	45.0	31.1	45.2	30.7
20	45.1	31.1	45.1	30.8	46.0	30.7
21	* 45.2	* 31.1	45.0	31.0	46.1	30.6
22	45.3	31.1	45.0	31.0	46.0	30.8
23	45.5	31.2	44.9	31.1	46.1	30.7
24	45.5	31.5	44.8	31.5	45.7	30.7
25	45.8	31.1	45.1	31.0	45.8	30.7
26	45.7	31.2	45.2	30.8	46.1	30.7
27	45.5	31.0	45.1	31.1	46.2	30.8
28	45.3	31.2	45.0	31.0	46.0	31.2
29	45.3	31.6	0.0	0.0	46.0	31.1
30	44.8	31.5	0.0	0.0	45.7	31.2
31	44.9	30.8	0.0	0.0	45.7	31.5
MEANS	45.1	31.2	45.0	30.9	45.3	31.0
OBSVNS.	29	29	28	28	31	31
MAXIMUM	45.8	32.0	45.5	31.5	46.2	31.9
MINIMUM	44.1	30.6	44.8	30.6	44.3	30.6
STD.DEV.	.40	.36	.15	.21	.62	.35

RACE ROCKS 48 17 57 N 123 31 48 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	31.2	46.0	31.5	48.6	31.4
2	45.6	31.4	46.3	31.0	48.5	31.4
3	46.0	31.2	47.7	31.4	48.1	31.1
4	46.3	31.5	47.9	31.2	48.6	31.2
5	46.8	31.6	48.0	31.1	48.7	31.2
6	46.7	31.5	47.7	31.6	48.3	31.6
7	46.5	31.5	47.5	32.0	48.5	31.8
8	46.5	31.2	47.1	31.8	48.5	31.9
9	46.8	31.2	47.2	32.0	48.7	31.6
10	46.7	31.2	46.8	31.4	49.0	31.4
11	46.7	31.1	46.9	31.6	49.2	31.2
12	46.8	31.1	46.6	31.6	49.4	31.2
13	46.8	31.0	46.6	31.5	49.9	30.4
14	47.0	31.1	46.7	31.6	50.2	30.7
15	46.6	30.8	47.1	31.5	50.6	30.6
16	46.5	30.7	47.9	31.1	51.6	29.9
17	46.8	30.6	48.3	30.7	51.6	29.3
18	47.5	30.8	* 48.4	* 30.7	51.7	29.8
19	47.3	30.7	48.5	30.8	51.6	30.2
20	47.8	30.7	48.4	31.1	50.3	30.8
21	47.0	31.1	47.7	31.8	49.5	31.1
22	47.3	31.1	47.7	31.8	49.3	31.4
23	47.2	31.4	47.5	32.0	49.0	31.8
24	47.0	31.6	47.5	31.9	49.0	31.8
25	46.6	31.9	46.8	32.1	49.1	31.5
26	47.0	31.5	47.0	32.0	48.6	31.6
27	46.8	31.6	47.1	31.9	49.2	31.0
28	46.6	31.5	47.7	32.1	49.5	30.8
29	46.7	31.4	47.5	31.9	50.1	31.0
30	47.2	31.2	47.8	31.8	50.9	31.2
31	0.0	0.0	48.0	31.4	0.0	0.0
MEANS	46.8	31.2	47.4	31.6	49.5	31.1
OBSVNS.	30	30	30	30	30	30
MAXIMUM	47.8	31.9	48.5	32.1	51.7	31.9
MINIMUM	45.6	30.6	46.0	30.7	48.1	29.3
STD.DEV.	.47	.32	.62	.39	1.08	.63

RACE ROCKS 48 17 57 N 123 31 48 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.6	31.2	52.7	29.3	52.0	30.6
2	49.7	31.1	52.0	29.5	52.2	30.7
3	49.4	30.7	51.2	30.0	52.0	30.7
4	49.6	31.1	52.7	29.8	52.3	30.7
5	49.8	31.1	51.6	30.2	51.2	30.8
6	49.7	31.1	52.0	30.0	50.9	31.0
7	49.5	31.1	52.5	30.2	52.0	30.8
8	50.2	31.1	53.3	29.4	51.8	30.8
9	50.0	31.2	54.1	29.1	50.6	31.2
10	50.0	30.8	54.2	28.9	50.8	31.4
11	50.1	30.7	54.5	28.6	51.0	31.4
12	50.3	30.6	52.9	29.3	51.9	31.5
13	50.4	30.3	52.6	29.3	51.2	31.6
14	51.5	29.9	52.5	29.7	51.4	31.8
15	50.3	30.7	52.0	30.2	51.0	31.9
16	50.1	30.8	51.7	31.0	50.5	32.0
17	49.8	31.0	50.2	31.9	50.0	32.1
18	50.0	31.1	50.0	31.9	49.4	32.1
19	49.5	31.6	49.3	31.9	50.5	31.2
20	49.3	31.8	49.2	31.8	50.0	32.1
21	49.0	31.9	49.9	31.6	49.5	31.6
22	49.1	31.5	50.0	31.6	50.0	31.6
23	49.8	31.6	50.3	31.5	50.4	31.5
24	50.2	31.2	50.5	31.5	* 51.1	* 31.4
25	49.0	31.4	49.8	31.6	51.8	31.2
26	49.8	31.1	51.0	31.4	51.8	31.5
27	50.2	30.8	51.5	31.0	51.5	31.5
28	51.3	30.2	51.6	31.0	51.6	31.1
29	51.4	30.2	52.0	31.0	52.5	31.1
30	51.6	30.3	52.0	31.2	52.1	30.8
31	53.7	29.4	51.9	31.0	0.0	0.0
MEANS	50.1	30.9	51.7	30.5	51.2	31.3
OBSVNS.	31	31	31	31	29	29
MAXIMUM	53.7	31.9	54.5	31.9	52.5	32.1
MINIMUM	49.0	29.4	49.2	28.6	49.4	30.6
STD.DEV.	.95	.55	1.41	1.04	.87	.47

RACE ROCKS 48 17 57 N 123 31 48 W

	OCTOBER		NOVEMBER		DECEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.0	30.4	48.4	31.9	47.2	31.9
2	51.6	30.8	48.2	32.0	47.6	32.1
3	50.7	31.2	47.6	32.3	47.7	31.9
4	52.0	31.2	47.7	32.0	47.6	31.8
5	50.5	31.5	47.5	32.1	47.3	31.8
6	50.8	31.9	47.7	32.5	47.1	31.9
7	49.2	31.9	47.8	32.3	47.3	31.9
8	* 49.9	* 31.8	47.5	32.1	47.2	31.8
9	50.6	31.6	47.4	32.1	47.4	31.9
10	50.5	31.9	47.7	32.1	47.3	31.9
11	50.1	31.6	47.8	32.3	47.0	31.9
12	50.0	31.6	47.7	32.0	47.1	31.9
13	49.7	31.8	47.6	32.3	47.2	31.9
14	49.5	31.9	47.7	32.5	47.0	32.0
15	49.2	32.3	47.5	32.0	47.1	31.9
16	49.4	32.0	47.7	32.1	47.4	31.8
17	49.5	31.9	47.5	32.3	47.0	31.8
18	49.3	32.0	47.5	32.3	47.0	31.8
19	49.3	32.3	47.5	32.3	47.2	31.6
20	49.1	32.3	47.3	32.1	47.0	31.8
21	48.4	32.0	46.8	32.1	46.7	31.8
22	48.7	32.0	47.0	32.0	46.3	31.8
23	48.8	32.1	47.4	31.9	46.0	31.4
24	48.6	32.3	48.0	32.1	46.0	31.5
25	48.4	31.9	47.3	32.0	46.4	31.6
26	48.8	32.0	47.1	31.8	46.5	31.8
27	48.7	31.5	47.0	31.9	46.2	31.6
28	49.0	31.1	47.0	32.0	46.3	31.8
29	48.8	31.8	47.0	32.0	46.0	31.9
30	48.7	31.5	47.2	32.0	46.3	31.9
31	48.2	32.1	0.0	0.0	46.1	31.8
MEANS	49.6	31.7	47.5	32.1	46.9	31.8
OBSVNS.	30	30	30	30	31	31
YRLY.MEANS....................................					48.0	31.3
MAXIMUM	52.0	32.3	48.4	32.5	47.7	32.1
MINIMUM	48.2	30.4	46.8	31.8	46.0	31.4
STD.DEV.	1.06	.45	.36	.18	.52	.14

CAPE MUDGE 49 59 56 N 125 11 38 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.5	28.1	44.9	28.2	* 0.0	* 0.0
2	42.6	28.1	43.6	27.8	* 0.0	* 0.0
3	43.7	28.6	* 44.2	* 28.1	* 0.0	* 0.0
4	43.8	28.1	* 44.8	* 28.5	44.6	28.1
5	44.3	28.8	45.4	28.9	45.3	28.2
6	45.9	29.4	45.9	29.0	46.0	28.6
7	44.2	28.5	45.0	28.8	45.0	28.8
8	45.3	29.4	45.0	28.9	* 44.8	* 28.7
9	41.9	28.6	44.4	28.6	* 44.7	* 28.6
10	42.3	28.5	43.5	28.2	44.5	28.5
11	41.8	28.6	* 0.0	* 0.0	45.0	27.8
12	41.6	28.8	* 0.0	* 0.0	44.4	28.5
13	43.2	28.8	* 0.0	* 0.0	44.5	28.4
14	* 0.0	* 0.0	44.2	28.4	* 44.4	* 28.3
15	* 0.0	* 0.0	* 44.4	* 28.2	* 44.3	* 28.1
16	* 0.0	* 0.0	44.6	28.0	44.2	28.0
17	* 0.0	* 0.0	43.9	28.0	45.5	27.8
18	* 0.0	* 0.0	44.8	27.6	45.9	28.1
19	44.4	27.8	45.5	28.5	46.4	28.5
20	44.3	27.6	* 45.2	* 28.3	46.5	27.6
21	42.3	28.0	45.0	28.2	47.7	28.5
22	44.8	28.5	43.8	28.0	48.5	28.5
23	45.0	28.8	* 44.0	* 28.2	47.9	28.6
24	45.0	28.1	* 44.2	* 28.4	47.9	28.8
25	44.5	28.2	44.4	28.6	45.6	28.0
26	43.3	27.8	43.5	28.5	* 0.0	* 0.0
27	42.9	27.6	43.5	29.3	* 0.0	* 0.0
28	44.6	28.8	* 0.0	* 0.0	* 0.0	* 0.0
29	44.2	28.4	0.0	0.0	45.1	28.2
30	43.9	28.1	0.0	0.0	45.8	28.8
31	42.6	28.1	0.0	0.0	46.3	28.0
MEANS	43.7	28.4	44.5	28.4	45.8	28.3
OBSVNS.	26	26	18	18	21	21
MAXIMUM	45.9	29.4	45.9	29.3	48.5	28.8
MINIMUM	41.6	27.6	43.5	27.6	44.2	27.6
STD.DEV.	1.19	.48	.75	.46	1.27	.35

CAPE MUDGE 49 59 56 N 125 11 38 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	47.4	27.7	51.2	28.5	53.9	26.7
2	47.0	28.2	52.2	28.4	52.5	27.7
3	47.7	28.0	51.9	28.9	* 53.9	* 27.9
4	* 0.0	* 0.0	54.5	28.0	55.4	28.1
5	* 0.0	* 0.0	51.2	27.7	55.5	26.8
6	* 0.0	* 0.0	50.2	27.8	53.8	26.1
7	48.3	27.7	50.6	28.6	52.5	26.9
8	46.9	28.1	51.0	27.7	50.5	26.8
9	48.0	28.0	47.9	28.6	50.8	26.8
10	* 46.8	* 28.2	47.6	28.5	51.4	26.8
11	45.6	28.4	48.0	28.4	52.5	26.4
12	46.0	27.8	48.0	28.0	53.8	26.7
13	47.0	28.0	49.5	27.8	54.6	27.3
14	46.4	28.1	* 50.0	* 27.9	* 54.7	* 27.3
15	* 47.7	* 27.9	50.6	28.1	54.8	27.3
16	49.1	27.8	56.4	28.1	55.4	27.3
17	48.9	28.1	53.3	27.8	56.9	28.1
18	50.0	27.2	52.6	28.2	54.8	27.2
19	* 50.0	* 27.9	56.0	27.7	53.2	28.2
20	50.0	28.6	59.0	27.1	54.3	28.9
21	* 49.6	* 28.5	53.9	28.2	50.3	28.6
22	49.2	28.4	52.5	28.0	52.6	28.4
23	50.3	28.5	52.0	27.1	53.9	28.5
24	* 48.6	* 28.8	* 51.6	* 26.8	51.6	27.6
25	47.0	29.0	51.2	26.5	52.1	28.0
26	46.7	28.8	52.5	24.3	* 52.1	* 28.0
27	47.1	28.5	52.9	23.5	52.2	28.0
28	47.2	28.6	* 51.9	* 25.4	55.3	27.2
29	* 48.1	* 28.8	50.8	27.4	56.0	27.8
30	49.1	28.9	54.8	26.7	56.7	28.0
31	0.0	0.0	54.9	26.7	0.0	0.0
MEANS	47.9	28.2	52.0	27.6	53.6	27.5
OBSVNS.	21	21	28	28	27	27
MAXIMUM	50.3	29.0	59.0	28.9	56.9	28.9
MINIMUM	45.6	27.2	47.6	23.5	50.3	26.1
STD.DEV.	1.37	.45	2.72	1.21	1.86	.74

CAPE MUDGE 49 59 56 N 125 11 38 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 57.0	* 27.6	56.2	27.7	56.7	26.4
2	57.4	27.1	55.4	26.9	56.8	26.8
3	* 57.8	* 27.2	55.2	27.1	58.2	25.6
4	58.3	27.4	53.1	28.1	54.9	27.4
5	56.4	27.3	52.9	28.5	56.2	27.7
6	54.5	27.4	50.1	28.1	59.2	26.3
7	57.0	27.3	50.8	28.0	58.1	26.3
8	51.9	27.4	51.1	28.6	57.8	26.5
9	54.9	26.9	50.4	28.8	55.2	27.1
10	55.6	26.5	52.1	28.5	61.4	26.1
11	59.4	25.6	52.9	28.4	60.1	26.4
12	60.8	25.4	* 54.1	* 28.4	61.9	25.5
13	59.3	25.8	55.3	28.4	56.6	26.3
14	58.0	25.8	55.7	28.0	55.8	26.9
15	57.7	25.0	56.3	27.8	59.4	26.3
16	55.9	24.3	56.2	28.1	59.9	25.9
17	* 58.3	* 24.5	61.2	27.8	58.5	25.9
18	60.8	24.8	59.1	27.2	52.8	27.3
19	61.9	24.7	62.4	26.4	55.7	26.8
20	57.8	25.6	57.3	27.1	51.9	27.4
21	57.4	25.4	59.1	26.0	54.7	26.8
22	55.8	25.0	52.6	25.8	53.5	27.3
23	56.1	25.1	58.7	25.1	53.2	27.6
24	57.5	25.0	59.0	25.5	54.9	27.2
25	56.8	25.1	63.3	25.1	54.3	27.2
26	56.8	25.6	62.6	25.1	52.9	28.5
27	58.4	25.8	59.3	25.6	51.9	28.5
28	60.7	26.3	55.3	26.7	51.6	29.0
29	59.2	26.9	61.1	25.9	52.3	28.9
30	55.5	27.7	58.2	25.8	50.9	29.1
31	55.6	27.3	59.7	25.9	0.0	0.0
MEANS	57.4	26.1	56.4	27.1	55.9	27.0
OBSVNS.	28	28	30	30	30	30
MAXIMUM	61.9	27.7	63.3	28.8	61.9	29.1
MINIMUM	51.9	24.3	50.1	25.1	50.9	25.5
STD.DEV.	2.20	1.03	3.83	1.22	3.06	.99

CAPE MUDGE 49 59 56 N 125 11 38 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 50.3	* 29.0	48.9	29.4	47.4	29.8
2	49.8	29.0	* 48.1	* 29.2	* 0.0	* 0.0
3	50.0	28.6	47.4	29.0	* 0.0	* 0.0
4	50.2	28.8	46.9	28.6	* 0.0	* 0.0
5	48.6	28.4	* 47.7	* 29.2	47.8	29.4
6	49.4	29.0	48.6	29.8	* 0.0	* 0.0
7	50.7	28.4	49.6	29.3	* 0.0	* 0.0
8	51.3	28.6	* 48.9	* 29.3	* 0.0	* 0.0
9	51.3	28.6	48.2	29.3	* 0.0	* 0.0
10	51.2	29.1	48.3	29.4	* 0.0	* 0.0
11	51.8	28.9	47.2	28.9	47.4	29.1
12	52.4	28.8	48.3	29.4	* 47.2	* 29.0
13	51.9	28.6	48.2	29.4	47.0	28.9
14	52.7	28.5	48.9	29.4	46.8	29.3
15	52.3	29.0	47.7	29.3	* 46.5	* 29.1
16	51.2	28.3	47.1	29.0	* 46.2	* 29.0
17	49.3	29.3	46.4	* 29.1	45.9	28.9
18	50.2	28.4	45.8	29.3	* 46.2	* 28.9
19	50.0	28.9	46.4	28.8	* 46.4	* 28.8
20	49.8	28.2	45.7	29.1	46.6	28.8
21	49.7	28.4	44.8	28.8	46.5	28.2
22	49.2	28.9	0.0	* 0.0	45.3	28.1
23	50.6	28.5	0.0	* 0.0	46.2	29.0
24	50.5	28.2	0.0	* 0.0	43.9	27.8
25	49.7	28.6	47.7	28.8	46.8	29.7
26	49.3	29.0	47.0	29.5	46.6	29.1
27	* 49.6	* 28.7	47.6	28.8	46.7	30.0
28	50.0	28.4	47.7	29.5	45.5	29.0
29	50.0	29.4	47.4	29.1	46.2	29.9
30	48.4	29.4	46.8	29.7	45.8	29.1
31	49.0	29.3	0.0	0.0	* 46.8	* 29.1
MEANS	50.4	28.7	47.4	29.2	46.4	29.1
OBSVNS.	29	29	24	23	17	17
YRLY.MEANS.....................................					50.7	27.9
MAXIMUM	52.7	29.4	49.6	29.8	47.8	30.0
MINIMUM	48.4	28.2	44.8	28.6	43.9	27.8
STD.DEV.	1.14	.36	1.12	.32	.93	.62

SISTERS ISLAND 49 29 13 N 124 26 00 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.0	28.4	43.2	28.5	44.0	28.5
2	43.9	28.4	42.8	27.3	43.5	28.0
3	42.0	27.8	43.0	27.3	43.3	28.0
4	42.5	28.2	43.0	27.3	44.0	28.4
5	42.0	28.2	43.0	28.1	43.3	28.1
6	42.5	28.2	43.3	28.2	44.0	28.4
7	41.8	28.4	43.4	27.8	43.2	28.2
8	41.4	28.4	43.1	27.3	43.0	28.4
9	41.7	28.4	42.7	27.4	44.0	28.5
10	41.7	28.8	42.6	28.1	43.9	28.5
11	* 41.5	* 28.7	43.2	28.4	43.3	28.5
12	41.2	28.5	43.5	28.6	44.3	28.8
13	41.8	28.6	43.3	29.1	43.6	28.6
14	43.7	28.8	44.1	28.6	43.5	28.6
15	44.2	28.6	44.5	29.5	44.1	28.6
16	43.8	28.9	44.4	29.5	44.5	28.0
17	43.7	28.6	44.5	27.4	44.6	28.8
18	44.2	28.9	43.9	28.9	44.6	28.8
19	44.3	28.9	44.3	29.1	45.1	28.4
20	44.1	28.5	44.0	29.1	46.5	29.0
21	43.8	28.6	45.1	29.3	46.0	29.0
22	43.3	28.8	44.7	29.4	47.2	29.1
23	43.2	28.6	44.8	29.7	47.7	29.3
24	43.3	28.2	44.0	29.5	47.0	29.0
25	43.0	28.4	44.0	29.3	45.4	28.9
26	43.2	28.2	43.0	27.7	45.3	29.0
27	43.2	28.4	43.0	27.3	45.1	28.9
28	43.3	28.0	43.6	27.8	44.9	29.5
29	43.3	28.1	0.0	0.0	45.0	28.5
30	42.6	28.4	0.0	0.0	45.1	28.2
31	43.0	28.4	0.0	0.0	46.2	27.3
MEANS	43.0	28.5	43.6	28.4	44.7	28.6
OBSVNS.	30	30	28	28	31	31
MAXIMUM	44.3	28.9	45.1	29.7	47.7	29.5
MINIMUM	41.2	27.8	42.6	27.3	43.0	27.3
STD.DEV.	.93	.27	.71	.84	1.26	.45

SISTERS ISLAND 49 29 13 N 124 26 00 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.4	28.8	49.6	28.0	56.5	23.7
2	46.0	28.0	50.5	27.7	56.5	24.0
3	47.0	27.3	51.2	27.4	53.0	25.5
4	46.4	27.2	53.0	27.7	54.0	24.8
5	46.5	27.7	52.0	27.3	53.5	24.6
6	46.0	27.6	52.5	27.1	53.8	22.7
7	46.8	26.9	50.5	27.8	53.9	22.7
8	46.6	26.9	49.9	27.4	54.4	22.6
9	46.2	27.1	49.0	27.7	54.8	22.6
10	46.4	27.3	49.0	27.7	56.0	24.3
11	46.5	27.3	49.2	27.1	55.0	25.1
12	46.0	27.6	49.3	27.4	56.1	24.6
13	47.0	28.0	50.2	28.4	57.8	24.2
14	46.1	28.0	51.2	25.4	61.2	23.9
15	47.3	28.0	51.0	26.8	60.0	24.4
16	47.9	28.5	51.5	26.7	61.4	24.8
17	50.3	28.4	53.0	26.0	60.3	26.3
18	49.2	28.5	55.5	24.7	61.2	25.6
19	48.3	28.4	54.0	25.6	62.2	25.6
20	49.7	28.4	54.3	26.1	58.1	25.6
21	48.6	28.8	55.7	24.7	58.6	25.6
22	48.3	28.8	52.5	25.5	57.7	25.6
23	48.8	29.0	52.2	24.8	58.4	25.9
24	48.2	29.0	52.0	22.9	58.2	26.4
25	47.6	29.0	51.5	24.2	59.4	26.1
26	47.8	28.8	52.0	24.3	57.6	26.3
27	49.2	28.9	53.3	22.9	55.8	24.4
28	49.9	28.4	54.0	25.5	56.9	23.5
29	51.0	28.0	54.7	24.6	59.4	19.7
30	50.0	28.0	56.0	24.4	59.0	19.1
31	0.0	0.0	59.0	23.1	0.0	0.0
MEANS	47.7	28.1	52.2	26.0	57.4	24.3
OBSVNS.	30	30	31	31	30	30
MAXIMUM	51.0	29.0	59.0	28.4	62.2	26.4
MINIMUM	45.4	26.9	49.0	22.9	53.0	19.1
STD.DEV.	1.53	.67	2.37	1.63	2.62	1.76

SISTERS ISLAND 49 29 13 N 124 26 00 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	60.5	22.1	66.4	24.7	66.7	25.8
2	60.0	22.5	65.5	24.8	67.1	26.0
3	58.5	21.8	61.4	25.0	67.3	25.1
4	60.0	22.2	60.5	26.3	65.0	26.0
5	60.0	22.7	59.5	26.1	65.0	25.0
6	61.5	22.6	58.5	26.5	62.2	25.8
7	61.0	22.7	56.5	26.7	63.0	25.8
8	61.1	23.3	58.8	26.3	62.0	25.8
9	62.0	22.6	63.5	26.1	59.6	25.6
10	60.6	23.0	59.3	27.2	59.5	25.4
11	60.2	21.8	62.4	26.4	59.5	25.6
12	59.9	18.2	60.5	26.7	59.2	25.0
13	59.9	16.9	63.1	26.4	61.0	24.6
14	62.8	14.6	61.0	26.5	62.4	25.2
15	60.1	16.6	62.0	26.7	62.0	24.8
16	59.5	15.4	62.0	26.4	62.8	25.4
17	57.8	23.1	62.3	26.7	60.8	26.4
18	60.9	19.9	61.3	25.2	60.5	25.9
19	61.9	20.3	62.0	25.9	61.2	25.6
20	62.3	20.4	58.5	26.0	60.4	26.3
21	61.8	21.7	58.4	24.8	61.5	27.1
22	61.1	21.0	59.7	24.3	62.1	26.8
23	60.9	20.9	61.2	21.8	60.9	27.1
24	61.5	22.2	62.5	23.3	61.5	26.5
25	61.5	24.7	62.8	22.5	61.4	26.9
26	59.6	23.8	63.1	24.3	54.5	28.2
27	61.3	23.7	63.0	26.0	58.4	27.3
28	62.5	24.4	65.3	25.8	56.2	28.0
29	63.4	25.8	64.6	25.1	55.6	28.6
30	66.3	25.0	64.9	26.9	55.0	28.5
31	64.1	24.2	65.3	26.9	0.0	0.0
MEANS	61.1	21.6	61.8	25.6	61.1	26.2
OBSVNS.	31	31	31	31	30	30
MAXIMUM	66.3	25.8	66.4	27.2	67.3	28.6
MINIMUM	57.8	14.6	56.5	21.8	54.5	24.6
STD.DEV.	1.65	2.76	2.44	1.31	3.23	1.10

SISTERS ISLAND 49 29 13 N 124 26 00 W

	OCTOBER		NOVEMBER		DECEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.1	28.5	50.5	29.3	46.1	28.9
2	54.4	29.3	49.8	29.4	46.3	29.1
3	53.6	29.1	49.1	29.7	46.5	29.7
4	52.4	29.0	49.2	29.9	46.9	29.4
5	51.8	29.5	49.2	29.8	46.9	29.8
6	52.1	28.9	49.2	29.5	46.8	29.8
7	53.0	28.9	49.2	30.3	47.2	29.8
8	53.5	28.5	49.0	29.7	47.0	29.8
9	53.4	28.2	48.9	29.5	47.1	30.0
10	53.5	28.1	49.2	29.3	47.0	29.9
11	54.0	28.1	48.5	28.9	46.9	29.3
12	54.0	28.4	48.5	28.9	46.5	29.3
13	53.3	28.5	48.5	28.8	46.6	29.1
14	53.9	28.4	48.5	28.8	46.5	29.1
15	53.5	28.4	48.0	29.0	46.3	28.8
16	54.0	27.8	47.8	28.9	46.6	28.9
17	54.0	28.1	47.8	29.0	46.2	28.6
18	52.6	28.2	48.0	28.9	46.0	28.6
19	53.2	28.0	47.7	29.1	46.0	28.6
20	53.0	28.1	47.0	28.9	46.3	28.9
21	52.4	28.2	46.8	29.1	46.0	28.6
22	52.4	28.2	47.0	29.1	45.5	28.8
23	52.2	28.2	47.2	29.3	45.6	28.8
24	52.2	28.6	47.6	29.4	45.2	28.8
25	51.3	28.4	47.3	29.0	45.6	28.8
26	52.1	29.1	46.6	28.8	45.9	29.0
27	51.5	29.1	46.3	28.8	45.2	29.1
28	51.2	29.1	46.5	28.8	45.0	29.1
29	51.2	29.1	46.4	28.9	45.2	* 29.2
30	50.5	29.5	46.5	29.0	44.6	29.3
31	50.5	29.5	0.0	0.0	44.6	29.0
MEANS	52.7	28.6	48.1	29.2	46.1	29.2
OBSVNS.	31	31	30	30	31	30
YRLY.MEANS					51.7	27.0
MAXIMUM	54.4	29.5	50.5	30.3	47.2	30.0
MINIMUM	50.5	27.8	46.3	28.8	44.6	28.6
STD.DEV.	1.11	.50	1.14	.39	.74	.43

CHROME ISLAND 49 28 20 N 124 40 57 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.6	28.4	43.4	28.5	44.2	28.2
2	44.6	28.6	43.8	28.8	43.6	26.9
3	41.8	27.7	44.4	28.8	42.3	26.9
4	42.8	28.2	44.4	28.6	43.4	27.6
5	42.6	28.4	44.6	26.9	43.7	28.2
6	43.0	28.6	43.0	23.9	44.0	28.2
7	42.3	28.4	43.5	28.0	43.6	28.0
8	42.2	28.1	43.2	27.6	43.6	28.6
9	41.2	28.0	43.3	28.0	43.8	28.8
10	41.5	28.0	43.4	27.8	44.5	28.2
11	42.0	28.4	43.6	28.6	44.6	28.9
12	42.3	28.4	43.4	28.1	44.5	29.0
13	42.4	28.0	43.7	28.6	43.0	27.1
14	43.5	28.2	44.2	29.1	43.6	28.6
15	46.0	28.6	44.6	29.3	44.0	29.0
16	46.0	28.9	44.0	27.2	44.6	28.9
17	45.0	28.5	44.2	27.4	44.3	28.8
18	45.7	29.4	44.6	29.1	45.0	24.4
19	43.7	24.2	44.3	28.2	45.4	26.8
20	43.8	25.8	44.3	28.6	46.4	27.7
21	44.0	28.5	44.6	28.6	46.8	27.2
22	44.4	28.6	44.3	28.6	46.0	28.0
23	44.5	28.4	44.4	29.1	46.4	27.7
24	44.6	28.8	44.3	29.1	46.0	28.0
25	44.6	28.5	44.4	29.3	45.8	27.6
26	44.0	28.4	43.8	29.4	44.9	29.3
27	44.0	28.5	43.7	28.1	44.8	29.0
28	43.4	27.1	44.0	28.6	45.0	29.4
29	44.4	28.5	0.0	0.0	44.8	29.1
30	43.0	28.1	0.0	0.0	44.8	29.1
31	43.4	28.4	0.0	0.0	45.0	28.1
MEANS	43.6	28.1	44.0	28.3	44.6	28.1
OBSVNS.	31	31	28	28	31	31
MAXIMUM	46.0	29.4	44.6	29.4	46.8	29.4
MINIMUM	41.2	24.2	43.0	23.9	42.3	24.4
STD.DEV.	1.27	.95	.49	1.08	1.06	1.02

CHROME ISLAND 49 28 20 N 124 40 57 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.1	28.5	47.3	28.9	55.4	24.4
2	45.4	29.0	48.2	28.6	51.6	27.7
3	45.8	28.6	48.9	28.0	50.4	28.5
4	45.7	28.1	50.8	28.4	51.0	28.6
5	45.5	27.8	48.3	27.8	53.5	26.3
6	45.4	28.4	48.7	28.6	52.3	27.7
7	45.5	28.6	48.0	28.9	52.0	27.3
8	46.0	28.2	47.7	29.0	52.5	26.1
9	47.0	27.7	47.0	29.0	53.7	25.5
10	45.7	26.0	46.6	29.4	55.4	25.0
11	45.8	28.2	47.5	29.5	56.5	24.4
12	45.4	27.6	48.5	28.8	58.8	23.5
13	45.8	27.6	49.4	28.6	60.0	24.0
14	46.3	28.5	49.6	28.1	60.5	24.7
15	47.8	28.2	49.8	28.1	58.2	25.6
16	48.0	28.5	50.8	28.1	58.0	25.5
17	48.6	28.2	53.6	28.0	60.8	25.5
18	50.2	26.9	53.2	28.0	59.9	25.5
19	47.8	27.4	51.9	28.0	60.5	25.1
20	47.8	28.4	52.2	28.9	59.1	25.9
21	46.7	27.7	50.5	28.2	55.4	27.2
22	46.6	27.8	49.8	28.4	52.9	28.2
23	47.5	27.8	50.0	28.4	55.0	26.8
24	47.8	28.1	50.0	27.8	56.7	26.7
25	47.4	28.0	49.7	28.5	59.2	26.4
26	47.0	28.2	49.5	28.9	55.1	27.1
27	47.0	27.7	50.3	26.4	56.4	26.1
28	49.0	23.7	53.2	24.3	52.0	28.2
29	50.6	26.7	55.0	24.0	54.9	26.7
30	50.0	27.6	56.2	23.4	60.6	21.8
31	0.0	0.0	56.9	24.2	0.0	0.0
MEANS	47.0	27.8	50.3	27.8	55.9	26.1
OBSVNS.	30	30	31	31	30	30
MAXIMUM	50.6	29.0	56.9	29.5	60.8	28.6
MINIMUM	45.1	23.7	46.6	23.4	50.4	21.8
STD.DEV.	1.53	.99	2.63	1.62	3.28	1.58

CHROME ISLAND 49 28 20 N 124 40 57 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	60.3	21.6	66.7	25.1	64.0	25.8
2	61.7	21.3	66.4	25.1	64.5	26.5
3	57.6	24.0	66.8	24.7	64.9	25.9
4	58.2	25.9	66.5	24.7	57.8	27.7
5	59.1	25.1	64.4	25.4	58.5	27.3
6	61.5	23.7	65.8	24.8	56.3	27.7
7	60.0	23.4	63.5	26.0	56.1	27.6
8	60.8	24.0	62.7	25.4	56.0	28.8
9	61.3	24.2	63.2	26.1	54.0	28.6
10	58.6	25.5	63.3	25.9	54.9	27.8
11	57.0	25.8	61.8	26.3	56.8	28.2
12	56.5	26.7	61.3	27.4	59.0	27.4
13	57.4	26.9	62.5	27.3	58.8	27.2
14	60.0	25.4	59.4	27.6	60.5	26.7
15	57.6	25.6	60.2	28.4	61.0	26.7
16	55.5	26.7	59.2	27.6	61.4	26.7
17	56.0	25.9	60.5	27.7	60.0	27.7
18	57.2	25.5	61.0	27.8	60.7	27.8
19	59.4	25.6	57.4	28.0	62.0	26.9
20	59.3	25.5	56.7	28.8	60.2	26.9
21	59.5	24.3	56.4	27.6	58.8	27.8
22	58.9	24.0	57.2	28.0	59.6	27.4
23	58.6	24.8	58.4	27.1	59.0	27.3
24	57.6	26.1	58.4	28.1	61.4	27.2
25	59.8	24.4	58.4	28.4	62.6	26.5
26	61.2	25.0	61.0	26.9	59.0	27.8
27	61.6	25.1	61.4	26.3	59.4	27.8
28	63.5	24.2	64.0	26.3	59.4	27.3
29	67.0	23.8	65.0	26.1	59.1	27.3
30	66.6	24.2	67.5	25.2	57.8	27.2
31	65.7	24.7	65.9	25.4	0.0	0.0
MEANS	59.8	24.8	62.0	26.6	59.4	27.3
OBSVNS.	31	31	31	31	30	30
MAXIMUM	67.0	26.9	67.5	28.8	64.9	28.8
MINIMUM	55.5	21.3	56.4	24.7	54.0	25.8
STD.DEV.	2.87	1.29	3.34	1.26	2.65	.68

CHROME ISLAND 49 28 20 N 124 40 57 W

	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	55.9	27.4	49.8	29.9	46.4	28.4
2	55.6	27.3	49.4	28.9	48.3	28.4
3	55.2	27.4	48.5	29.0	47.0	28.4
4	52.4	28.9	49.5	29.0	47.4	29.1
5	52.3	29.4	49.2	28.6	47.4	29.3
6	52.0	29.8	49.1	29.8	47.5	29.9
7	51.9	29.7	48.9	30.3	47.6	30.6
8	52.0	29.3	48.6	29.8	47.3	29.8
9	54.6	29.3	48.5	30.7	47.3	29.3
10	52.8	29.5	48.2	30.4	47.3	30.0
11	52.0	29.5	47.9	29.9	47.0	29.3
12	52.2	29.7	47.7	25.1	46.9	29.8
13	52.0	29.9	48.0	28.4	47.0	30.8
14	51.8	29.5	48.0	29.4	46.6	30.0
15	52.2	29.0	47.7	29.4	46.7	29.7
16	52.8	29.5	47.6	28.8	46.5	29.4
17	53.0	29.1	47.8	29.4	46.4	29.9
18	52.4	29.8	47.6	30.4	46.3	29.4
19	51.6	29.9	47.5	29.9	46.4	29.7
20	51.0	29.0	46.7	30.7	46.5	29.9
21	51.0	28.2	46.6	30.2	46.4	30.0
22	51.2	29.8	46.7	30.3	45.2	28.5
23	51.3	28.4	47.0	30.8	44.4	28.5
24	51.4	29.3	47.6	30.7	45.6	29.8
25	51.5	28.0	45.7	22.2	45.8	29.7
26	51.2	29.3	46.4	26.1	46.2	29.9
27	51.0	29.0	46.6	26.5	45.6	29.7
28	50.8	29.9	46.4	27.2	45.3	28.9
29	50.4	29.1	46.4	28.5	45.6	29.0
30	50.0	29.8	47.8	27.8	45.0	29.3
31	50.0	29.8	0.0	0.0	45.4	29.3
MEANS	52.1	29.1	47.8	28.9	46.5	29.5
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					51.1	27.7
MAXIMUM	55.9	29.9	49.8	30.8	48.3	30.8
MINIMUM	50.0	27.3	45.7	22.2	44.4	28.4
STD.DEV.	1.47	.76	1.06	1.91	.89	.61

DEPARTURE BAY 49 12 38 N 123 57 17 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.2	26.7	42.0	26.7	43.0	25.4
2	42.5	26.8	41.8	27.4	42.3	28.5
3	41.0	29.0	43.0	27.1	41.5	27.4
4	40.5	27.7	45.4	28.5	44.2	27.1
5	39.3	27.3	43.7	25.8	* 43.4	* 28.2
6	38.2	28.1	41.7	24.6	42.5	29.3
7	42.6	28.5	41.5	24.6	41.7	30.0
8	39.3	27.2	42.1	25.5	* 42.0	* 28.1
9	41.0	28.2	42.5	27.2	42.3	26.3
10	41.0	28.1	41.3	25.1	43.0	22.9
11	40.2	27.6	42.3	24.8	42.8	24.4
12	38.0	28.0	42.4	24.8	44.5	25.9
13	42.3	28.8	42.2	25.4	44.7	27.2
14	43.5	27.3	42.7	25.4	45.5	28.5
15	43.0	16.6	44.2	25.8	44.3	24.2
16	43.3	17.1	43.2	23.8	45.0	22.5
17	43.2	20.9	44.1	28.6	45.3	26.9
18	43.0	21.2	44.0	23.0	47.1	26.7
19	44.7	29.0	45.3	28.2	46.9	27.2
20	42.3	28.8	43.7	27.1	47.5	26.9
21	41.5	25.9	45.2	27.7	47.0	27.3
22	42.7	23.1	44.0	27.6	47.3	27.6
23	43.5	25.8	42.3	26.9	46.2	27.2
24	45.4	30.7	42.3	26.1	46.3	26.5
25	43.5	26.9	43.1	26.1	47.0	24.4
26	42.3	28.1	42.8	28.5	47.0	24.2
27	42.5	26.1	41.0	26.5	45.2	17.9
28	42.0	26.4	41.4	21.8	44.5	19.2
29	42.7	26.3	0.0	0.0	* 45.0	* 22.1
30	41.4	26.5	0.0	0.0	45.5	25.1
31	38.1	20.4	0.0	0.0	45.3	28.0
MEANS	41.9	26.1	42.9	26.1	44.8	25.9
OBSVNS.	31	31	28	28	28	28
MAXIMUM	45.4	30.7	45.4	28.6	47.5	30.0
MINIMUM	38.0	16.6	41.0	21.8	41.5	17.9
STD.DEV.	1.85	3.43	1.23	1.69	1.86	2.75

DEPARTURE BAY 49 12 38 N 123 57 17 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 46.4	* 26.2	51.5	25.8	* 54.7	* 23.6
2	47.5	24.3	52.0	26.3	54.1	24.3
3	48.0	26.5	53.2	26.0	53.2	24.4
4	46.3	26.5	* 53.2	* 25.9	52.7	26.8
5	47.1	24.4	* 53.1	* 25.8	52.0	26.5
6	45.4	26.4	53.1	25.6	54.1	21.3
7	44.0	23.7	51.7	25.8	* 0.0	* 20.8
8	46.2	25.5	51.5	21.2	* 0.0	* 20.2
9	47.2	25.1	52.6	21.0	58.2	19.6
10	46.5	25.0	52.3	23.5	60.2	20.4
11	47.5	24.3	* 52.6	* 21.5	61.0	21.6
12	46.5	26.7	* 52.9	* 19.5	63.5	21.6
13	50.0	25.6	53.3	17.4	63.3	23.5
14	47.4	25.5	50.0	22.7	63.2	20.9
15	48.3	26.0	50.6	26.4	* 63.2	* 21.9
16	51.0	25.9	53.0	26.3	* 63.3	* 22.9
17	51.0	25.5	* 0.0	* 0.0	63.3	23.9
18	51.3	27.3	* 0.0	* 0.0	63.5	25.9
19	50.0	26.9	* 0.0	* 0.0	60.2	24.8
20	49.2	26.1	* 0.0	* 0.0	60.0	24.3
21	48.0	26.7	53.1	25.9	59.5	24.4
22	47.0	28.6	53.2	25.8	* 59.4	* 23.4
23	48.3	28.4	50.7	26.3	59.2	22.4
24	50.1	27.7	51.0	27.4	60.8	22.2
25	49.0	27.3	* 51.7	* 26.1	58.5	22.1
26	48.6	25.8	* 52.4	* 24.8	58.0	23.8
27	48.5	26.5	53.2	23.4	54.5	26.3
28	50.5	25.8	56.0	20.4	* 0.0	* 0.0
29	51.0	25.9	57.1	20.8	* 0.0	* 0.0
30	53.2	25.5	55.7	22.2	* 0.0	* 0.0
31	0.0	0.0	* 55.2	* 22.9	0.0	0.0
MEANS	48.4	26.0	52.7	24.0	58.7	23.4
OBSVNS.	29	29	20	20	21	21
MAXIMUM	53.2	28.6	57.1	27.4	63.5	26.8
MINIMUM	44.0	23.7	50.0	17.4	52.0	19.6
STD.DEV.	2.05	1.17	1.83	2.74	3.86	2.08

DEPARTURE BAY 49 12 38 N 123 57 17 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 0.0	* 0.0	68.3	23.5	* 0.0	* 0.0
2	61.1	17.1	64.0	23.5	* 0.0	* 0.0
3	60.0	17.3	* 0.0	* 0.0	62.0	25.9
4	56.0	24.3	* 0.0	* 0.0	61.5	26.4
5	55.4	26.1	* 0.0	* 0.0	61.0	26.7
6	61.3	20.8	62.5	25.1	61.0	28.5
7	61.0	19.4	63.2	23.8	* 61.0	* 28.5
8	60.0	16.7	62.3	24.3	* 60.0	* 28.5
9	* 0.0	* 0.0	63.0	25.4	60.0	28.5
10	* 0.0	* 0.0	* 62.7	* 25.7	61.5	29.0
11	* 0.0	* 0.0	* 62.4	* 26.0	60.5	25.8
12	56.2	24.2	62.0	26.3	59.5	24.0
13	55.1	23.7	63.0	27.2	60.0	23.0
14	* 58.5	* 17.7	61.8	26.1	* 59.5	* 23.8
15	62.0	11.6	61.6	26.7	* 59.0	* 24.6
16	58.3	15.2	64.5	27.6	58.5	25.4
17	60.6	21.0	* 0.0	* 0.0	59.0	24.6
18	59.0	24.0	* 0.0	* 0.0	59.0	24.6
19	58.2	21.0	* 0.0	* 0.0	58.3	25.5
20	* 58.6	* 20.5	55.0	27.7	60.0	25.5
21	* 59.0	* 20.0	53.3	27.7	* 59.3	* 25.4
22	59.5	19.4	54.0	28.5	* 58.5	* 25.3
23	59.3	20.3	56.2	27.8	57.7	25.2
24	61.2	20.5	* 58.9	* 25.8	58.2	25.1
25	62.0	21.3	* 61.6	* 23.7	57.3	26.3
26	65.5	20.6	64.3	21.6	57.5	25.9
27	* 66.4	* 21.5	62.2	22.0	58.0	26.7
28	* 67.3	* 22.4	63.0	22.6	* 57.7	* 26.7
29	68.2	23.4	65.3	22.4	* 57.4	* 26.8
30	67.0	25.0	63.5	22.7	57.0	26.9
31	65.0	24.6	* 0.0	* 0.0	0.0	0.0
MEANS	60.5	20.8	61.6	25.1	59.4	26.0
OBSVNS.	22	22	20	20	20	20
MAXIMUM	68.2	26.1	68.3	28.5	62.0	29.0
MINIMUM	55.1	11.6	53.3	21.6	57.0	23.0
STD.DEV.	3.53	3.60	3.93	2.26	1.55	1.50

DEPARTURE BAY 49 12 38 N 123 57 17 W

	OCTOBER		NOVEMBER		DECEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.5	27.6	49.5	28.8	* 45.2	* 27.6
2	54.0	27.6	* 49.4	* 28.8	45.3	27.3
3	54.0	28.2	* 49.2	* 28.7	45.3	25.4
4	52.3	27.4	49.0	28.6	47.0	24.8
5	* 52.2	* 27.3	49.0	28.6	45.2	26.8
6	* 52.1	* 27.1	49.5	28.8	44.5	25.5
7	52.0	26.9	48.0	28.8	* 44.8	* 25.6
8	52.0	27.7	47.0	29.1	* 45.1	* 25.7
9	53.4	27.6	* 0.0	* 0.0	45.5	25.8
10	53.6	27.4	* 0.0	* 0.0	44.5	26.0
11	54.0	28.1	* 0.0	* 0.0	49.2	29.1
12	* 0.0	* 0.0	48.0	29.0	44.7	27.1
13	* 0.0	* 0.0	48.0	29.0	45.3	26.8
14	* 0.0	* 0.0	48.0	28.5	* 45.3	* 25.1
15	54.7	28.4	48.0	28.5	* 45.3	* 23.4
16	51.5	27.7	* 47.7	* 28.4	45.3	21.6
17	50.5	28.4	* 47.4	* 28.2	45.2	28.9
18	51.5	28.0	47.0	28.0	44.3	25.5
19	* 52.1	* 28.0	47.5	28.2	45.0	26.3
20	* 52.8	* 28.0	* 46.8	* 28.6	44.2	25.8
21	53.5	28.0	46.0	29.0	* 44.3	* 25.8
22	53.6	28.1	44.0	27.3	* 44.4	* 25.9
23	53.4	28.4	* 45.0	* 27.7	44.5	26.0
24	53.5	28.4	* 46.0	* 28.1	42.0	25.9
25	52.0	28.2	47.0	28.6	* 42.6	* 26.9
26	* 51.9	* 28.3	44.0	25.8	* 43.3	* 28.0
27	* 51.7	* 28.4	43.0	29.0	44.0	29.1
28	51.5	28.5	45.0	28.0	* 43.4	* 29.1
29	51.0	29.0	45.0	28.0	* 42.7	* 29.2
30	50.0	28.6	* 45.1	* 27.8	42.0	29.3
31	50.0	28.8	0.0	0.0	* 43.0	* 29.0
MEANS	52.6	28.0	47.0	28.4	44.9	26.5
OBSVNS.	22	22	19	19	19	19
YRLY.MEANS..					50.5	25.6
MAXIMUM	54.7	29.0	49.5	29.1	49.2	29.3
MINIMUM	50.0	26.9	43.0	25.8	42.0	21.6
STD.DEV.	1.45	.51	1.95	.78	1.55	1.83

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.1	26.8	42.0	25.9	44.6	28.6
2	42.3	27.2	42.5	26.3	43.8	28.4
3	41.8	27.1	44.5	28.0	43.0	27.1
4	42.2	27.1	44.6	27.6	43.3	27.1
5	42.5	27.2	42.9	26.1	43.2	26.9
6	41.7	27.1	42.4	24.2	43.6	26.8
7	41.2	27.2	42.5	25.4	43.1	27.3
8	42.4	27.3	42.6	25.6	* 43.7	* 27.6
9	41.1	26.9	42.9	26.3	* 44.4	* 27.9
10	41.8	27.7	42.0	25.4	45.1	28.2
11	43.2	28.6	43.6	27.8	* 44.0	* 27.7
12	43.0	28.4	44.3	28.4	42.8	27.2
13	44.6	28.8	44.8	28.2	43.3	26.1
14	45.2	28.5	45.9	29.3	43.8	25.8
15	46.2	28.6	45.7	29.3	43.4	26.1
16	45.9	28.4	45.8	29.3	43.8	26.5
17	44.5	26.3	44.3	26.5	43.7	25.5
18	46.2	29.3	45.5	28.6	45.2	22.7
19	44.2	27.7	45.9	28.6	46.2	26.8
20	45.8	* 27.8	44.9	28.4	44.8	26.9
21	* 45.4	* 28.0	45.7	28.8	43.8	25.6
22	45.0	28.1	45.0	28.5	44.8	26.5
23	* 44.6	* 25.8	44.8	28.8	45.0	27.1
24	44.1	23.4	45.0	28.9	45.3	26.3
25	43.2	26.9	44.2	28.8	45.8	26.8
26	41.8	25.8	43.8	28.1	45.2	27.8
27	42.5	26.1	43.1	27.2	45.0	28.4
28	42.4	26.4	44.2	28.1	44.9	28.5
29	42.8	26.1	0.0	0.0	44.8	28.5
30	42.4	27.3	0.0	0.0	45.1	28.4
31	43.3	27.6	0.0	0.0	45.7	26.9
MEANS	43.3	27.3	44.1	27.6	44.4	27.0
OBSVNS.	29	28	28	28	28	28
MAXIMUM	46.2	29.3	45.9	29.3	46.2	28.6
MINIMUM	41.1	23.4	42.0	24.2	42.8	22.7
STD.DEV.	1.55	1.18	1.27	1.43	.96	1.25

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.2	28.2	50.0	26.0	55.0	24.2
2	46.2	26.7	50.6	26.1	54.5	25.0
3	46.4	27.3	52.8	26.5	52.5	25.9
4	45.4	27.4	54.3	26.0	50.7	27.1
5	45.3	28.6	51.0	26.7	50.3	27.1
6	45.3	28.6	51.8	26.7	51.5	26.0
7	45.0	28.4	50.4	27.1	52.5	24.3
8	45.2	28.2	53.1	20.3	54.6	19.6
9	46.5	25.1	49.8	26.3	55.4	19.6
10	47.2	24.4	52.0	23.0	57.1	19.5
11	46.0	27.2	51.7	19.5	58.2	19.4
12	46.0	26.9	52.2	18.8	57.8	21.4
13	46.2	25.1	* 50.4	* 23.1	59.5	21.7
14	47.3	26.4	48.5	27.4	60.6	22.1
15	47.8	26.3	51.3	24.8	57.2	24.6
16	50.5	25.9	52.7	24.2	55.5	24.3
17	49.7	25.9	55.4	17.5	60.8	23.9
18	49.8	26.3	55.9	22.1	59.5	23.8
19	49.0	26.4	53.8	24.6	57.3	24.3
20	50.3	26.8	54.1	25.6	58.8	24.2
21	47.4	27.7	51.5	27.3	57.2	25.2
22	46.5	28.0	49.8	27.3	57.0	25.2
23	48.3	27.4	48.8	27.8	56.9	23.3
24	48.8	26.5	48.5	27.8	58.0	23.8
25	47.9	27.1	48.3	28.5	59.3	21.2
26	48.7	25.9	48.5	27.8	58.1	22.1
27	49.5	26.7	51.7	24.0	* 56.3	* 24.6
28	49.0	26.7	53.8	20.9	54.5	27.2
29	50.5	26.0	56.5	19.9	55.2	26.9
30	51.2	26.7	55.8	21.0	63.2	20.1
31	0.0	0.0	58.0	22.9	0.0	0.0
MEANS	47.6	26.8	52.1	24.5	56.5	23.6
OBSVNS.	30	30	30	30	29	29
MAXIMUM	51.2	28.6	58.0	28.5	63.2	27.2
MINIMUM	45.0	24.4	48.3	17.5	50.3	19.4
STD.DEV.	1.89	1.05	2.60	3.14	3.10	2.44

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	61.9	15.8	63.7	22.5	63.5	24.3
2	63.8	17.0	64.0	21.6	62.3	24.6
3	59.1	20.1	64.6	21.4	60.6	26.8
4	54.4	24.6	64.3	22.0	58.3	26.5
5	55.4	24.8	62.8	22.7	56.6	27.7
6	59.2	19.5	60.7	23.9	56.5	27.7
7	60.7	18.6	61.2	24.2	57.4	28.2
8	59.6	20.1	61.0	25.0	60.0	24.0
9	60.4	19.5	62.3	23.4	53.8	28.2
10	56.6	24.2	59.6	25.1	55.6	28.0
11	54.6	26.5	60.2	25.4	59.5	24.0
12	55.2	26.4	61.7	25.2	61.5	23.0
13	61.4	17.4	63.8	24.0	61.2	22.7
14	61.7	14.8	57.2	26.9	62.0	23.3
15	61.8	11.0	63.6	23.1	61.5	23.1
16	58.7	19.4	58.4	26.5	60.6	24.0
17	55.2	25.0	61.6	23.8	61.0	23.9
18	55.0	24.3	56.4	27.3	60.0	25.1
19	56.5	24.3	57.4	26.9	61.0	24.4
20	59.4	15.3	56.3	27.3	61.2	25.1
21	61.2	15.8	54.8	27.2	62.0	24.7
22	60.5	17.8	56.1	27.1	62.4	24.6
23	59.7	18.6	59.3	25.2	62.8	24.8
24	61.7	18.8	59.6	24.6	62.6	25.2
25	61.5	19.0	63.0	20.9	63.2	24.8
26	62.3	20.3	62.8	21.3	59.4	25.9
27	62.8	20.5	63.5	22.4	58.0	26.4
28	64.3	21.7	63.8	22.5	56.2	27.6
29	62.7	22.9	65.2	22.9	57.3	27.7
30	64.2	22.5	64.3	22.5	57.0	27.7
31	62.7	22.4	64.8	22.7	0.0	0.0
MEANS	59.8	20.3	61.2	24.1	59.8	25.5
OBSVNS.	31	31	31	31	30	30
MAXIMUM	64.3	26.5	65.2	27.3	63.5	28.2
MINIMUM	54.4	11.0	54.8	20.9	53.8	22.7
STD.DEV.	3.04	3.75	3.00	2.00	2.57	1.75

ENTRANCE ISLAND 49 12 34 N 123 48 27 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1974 TEMP	DECEMBER 1974 SAL
1	56.6	27.7	50.0	27.8	45.9	27.7
2	53.4	28.1	49.8	28.0	46.8	28.0
3	55.6	27.8	49.4	28.0	47.4	29.0
4	54.5	27.8	49.4	28.6	46.7	28.1
5	53.2	27.8	49.5	28.5	46.3	27.8
6	54.0	27.6	49.0	29.1	46.5	27.1
7	54.3	27.4	48.9	29.1	46.3	27.3
8	54.8	27.8	48.8	29.1	46.2	26.8
9	54.9	27.7	48.5	29.3	47.0	28.2
10	52.5	27.8	48.2	29.1	47.4	29.3
11	54.4	27.7	48.1	29.5	47.3	29.7
12	53.6	27.6	48.5	28.9	* 46.6	* 28.3
13	53.1	27.6	48.1	27.8	45.8	26.8
14	52.4	27.2	47.8	27.1	46.3	27.8
15	53.9	27.4	47.5	25.9	46.4	28.8
16	53.8	27.7	47.8	27.2	47.5	29.1
17	54.6	27.4	48.2	28.9	46.4	28.9
18	52.5	26.8	48.5	29.4	46.5	28.8
19	* 52.1	* 27.4	47.9	29.0	46.4	28.2
20	51.6	28.1	47.5	29.3	46.5	28.0
21	52.0	27.6	46.6	28.0	45.8	27.7
22	52.8	27.6	46.8	28.4	45.1	27.4
23	52.4	27.4	47.2	28.9	44.3	26.9
24	52.4	27.3	48.3	29.7	45.2	27.8
25	52.1	27.4	47.2	25.1	46.3	28.8
26	52.2	27.4	45.8	26.1	46.5	29.0
27	* 51.1	* 27.8	45.9	26.4	46.0	28.9
28	50.0	28.2	45.3	27.3	44.0	27.8
29	49.3	28.6	45.5	27.4	46.0	28.9
30	50.0	28.2	44.2	26.3	45.6	29.0
31	49.8	28.6	0.0	0.0	45.6	28.8
MEANS	53.0	27.7	47.8	28.1	46.2	28.2
OBSVNS.	29	29	30	30	30	30
YRLY.MEANS....................................					51.5	25.8
MAXIMUM	56.6	28.6	50.0	29.7	47.5	29.7
MINIMUM	49.3	26.8	44.2	25.1	44.0	26.8
STD.DEV.	1.75	.39	1.42	1.22	.82	.80

ACTIVE PASS 48 52 26 N 123 17 23 W

	JANUARY		FEBRUARY		MARCH	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	41.7	27.2	43.8	28.6	44.2	29.5
2	41.3	27.2	44.4	28.8	42.3	26.0
3	42.1	28.5	45.3	29.7	42.5	25.0
4	39.3	24.7	45.3	29.5	44.7	28.5
5	41.2	28.4	43.3	26.0	44.0	26.1
6	42.4	28.4	43.3	26.4	43.7	28.0
7	41.5	28.6	43.7	27.3	43.9	27.8
8	42.1	28.4	43.2	27.4	43.1	27.4
9	41.2	28.8	42.2	26.3	44.3	29.0
10	41.9	29.0	41.7	24.2	45.1	29.1
11	42.2	28.9	42.6	26.0	44.6	28.6
12	41.2	28.1	43.9	28.5	45.0	29.1
13	44.4	29.3	43.5	28.0	43.4	29.4
14	45.2	29.3	45.0	29.7	43.1	28.8
15	45.8	30.2	45.0	29.4	43.6	27.7
16	45.7	29.3	45.2	29.8	44.8	27.8
17	44.6	30.0	44.6	29.5	44.7	28.2
18	45.3	30.0	45.1	29.9	45.8	24.8
19	45.0	30.4	46.2	28.2	46.2	20.3
20	44.3	29.5	45.2	29.3	45.9	27.6
21	43.2	27.2	45.5	30.0	46.2	26.5
22	45.2	29.1	44.8	29.7	46.7	26.7
23	45.5	29.9	44.7	29.3	45.9	27.8
24	45.7	29.5	44.3	29.3	46.2	26.8
25	44.7	29.5	43.8	29.1	45.2	27.6
26	41.9	22.9	44.1	28.8	45.7	27.8
27	42.6	28.8	43.9	29.0	45.3	28.6
28	43.6	28.4	44.2	29.0	45.2	28.4
29	43.3	27.7	0.0	0.0	45.0	29.0
30	41.8	26.8	0.0	0.0	45.5	29.5
31	42.9	27.8	0.0	0.0	45.9	28.6
MEANS	43.2	28.4	44.2	28.5	44.8	27.7
OBSVNS.	31	31	28	28	31	31
MAXIMUM	45.8	30.4	46.2	30.0	46.7	29.5
MINIMUM	39.3	22.9	41.7	24.2	42.3	20.3
STD.DEV.	1.76	1.57	1.05	1.48	1.16	1.81

ACTIVE PASS 48 52 26 N 123 17 23 W

	APRIL		MAY		JUNE	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 46.3	* 28.8	48.1	28.4	52.4	25.4
2	46.7	29.1	47.8	28.1	51.2	26.7
3	48.3	29.1	49.3	27.8	49.2	27.8
4	46.2	28.2	49.8	27.8	49.8	29.3
5	46.6	29.4	46.8	28.9	50.7	28.0
6	46.6	29.4	48.3	26.7	50.7	27.2
7	46.9	29.4	48.6	28.2	53.3	24.0
8	46.6	29.3	47.1	29.5	52.3	25.2
9	47.3	26.3	46.7	29.0	55.7	19.5
10	45.8	28.2	47.6	28.6	54.3	20.3
11	45.3	28.8	48.1	22.7	58.2	10.3
12	45.2	22.7	49.2	10.6	58.4	16.3
13	46.0	26.5	50.6	11.0	60.2	17.6
14	47.7	17.3	50.2	27.6	58.0	23.9
15	47.7	26.5	52.7	19.5	56.2	25.9
16	48.4	26.3	50.1	25.9	62.1	19.4
17	50.4	23.7	55.7	11.2	62.6	11.9
18	49.7	22.4	52.7	26.0	61.6	16.9
19	47.7	28.6	51.7	27.1	62.1	23.0
20	50.1	27.7	51.8	27.6	60.1	24.8
21	47.3	28.6	50.4	28.1	54.6	27.8
22	47.3	28.6	47.8	29.4	52.3	27.1
23	48.7	24.3	47.5	28.8	60.7	12.0
24	47.3	27.6	47.9	28.8	58.2	13.3
25	46.8	28.8	49.3	29.0	52.8	24.6
26	47.2	28.8	48.7	29.5	53.6	24.4
27	46.8	29.0	51.8	23.4	* 53.4	* 25.6
28	47.3	28.4	54.1	15.7	53.2	26.9
29	48.5	28.0	53.2	18.0	54.6	26.8
30	50.2	28.4	54.7	19.9	60.8	17.1
31	0.0	0.0	58.0	20.4	0.0	0.0
MEANS	47.5	27.2	50.2	24.6	55.9	22.2
OBSVNS.	29	29	31	31	29	29
MAXIMUM	50.4	29.4	58.0	29.5	62.6	29.3
MINIMUM	45.2	17.3	46.7	10.6	49.2	10.3
STD.DEV.	1.38	2.76	2.83	5.88	4.18	5.59

ACTIVE PASS 46 52 26 N 123 17 23 W

	JULY		AUGUST		SEPTEMBER 1974	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.2	11.6	64.3	10.2	56.8	27.8
2	61.8	16.0	67.0	10.1	59.6	26.4
3	54.4	22.7	68.4	14.2	55.3	27.7
4	53.4	27.2	66.5	14.0	53.1	28.2
5	58.1	22.1	65.2	26.8	53.2	28.2
6	64.5	10.8	62.8	22.9	55.2	28.8
7	57.8	17.8	61.5	23.0	56.6	25.9
8	59.6	4.7	63.4	16.0	53.8	27.8
9	54.2	24.7	64.9	16.0	52.2	28.5
10	52.1	28.4	62.5	14.1	57.2	26.3
11	53.0	28.1	62.2	23.4	56.6	25.8
12	53.2	28.1	58.0	26.0	60.3	15.7
13	60.0	12.8	61.3	* 27.2	60.7	22.2
14	58.7	20.1	54.5	28.4	58.8	23.7
15	59.8	12.0	55.0	28.4	56.4	26.3
16	55.3	22.2	53.8	29.3	54.7	27.3
17	53.1	27.8	54.4	28.9	56.6	26.4
18	52.7	27.8	52.2	28.9	61.3	19.7
19	55.2	26.1	52.2	29.0	60.2	22.4
20	64.7	10.2	54.0	28.2	59.2	23.7
21	57.8	19.1	53.8	28.6	58.0	25.0
22	57.6	20.0	53.8	27.4	56.7	26.3
23	61.7	10.5	57.5	21.3	61.2	15.7
24	56.5	24.2	55.7	26.5	61.2	23.5
25	60.3	11.1	60.7	17.5	57.4	28.5
26	62.1	27.6	63.6	14.0	60.7	25.2
27	64.6	14.9	64.0	20.8	56.2	27.7
28	66.1	11.9	64.6	22.1	58.1	27.1
29	64.4	17.6	66.3	20.0	57.3	26.8
30	65.7	14.0	63.3	24.7	56.2	27.3
31	68.8	20.8	62.2	25.5	0.0	0.0
MEANS	58.9	19.1	60.3	22.2	57.4	25.4
OBSVNS.	31	31	31	30	30	30
MAXIMUM	68.8	28.4	68.4	29.3	61.3	28.8
MINIMUM	52.1	4.7	52.2	10.1	52.2	15.7
STD.DEV.	4.66	6.90	5.02	6.16	2.58	3.40

ACTIVE PASS 48 52 26 N 123 17 23 W

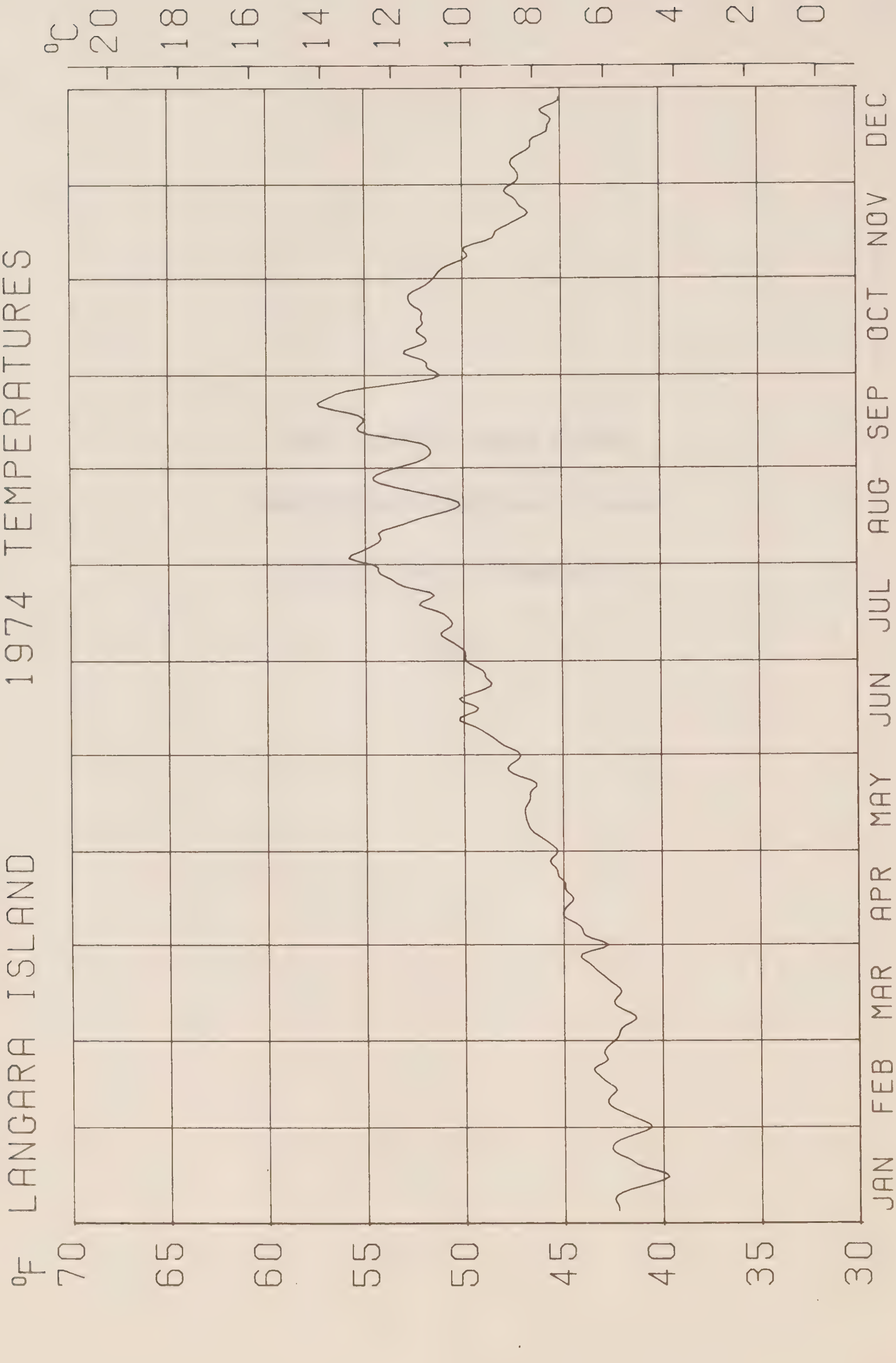
	OCTOBER		NOVEMBER		DECEMBER	1974
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	55.3	27.6	49.4	27.1	47.0	29.0
2	55.3	27.6	48.8	27.8	46.7	29.4
3	55.9	27.8	48.7	28.4	47.2	29.5
4	52.8	27.3	48.8	29.0	46.8	28.5
5	52.0	27.7	48.8	30.0	46.7	29.7
6	51.5	26.5	49.1	30.2	46.9	29.4
7	52.4	28.0	48.8	29.3	46.9	29.8
8	55.3	25.1	48.7	29.7	46.8	28.9
9	53.8	28.6	48.7	29.5	47.2	29.5
10	52.7	28.0	48.5	29.7	47.2	30.0
11	53.8	27.8	48.2	30.0	47.2	29.9
12	52.8	28.9	48.4	29.0	46.2	29.8
13	52.7	26.0	48.5	28.2	46.8	30.2
14	52.3	26.9	48.2	25.1	46.9	30.2
15	51.7	28.5	47.9	28.5	46.6	30.0
16	51.3	28.5	47.9	29.7	47.7	30.4
17	49.2	29.3	47.6	29.8	* 47.2	* 30.2
18	49.7	29.7	47.6	30.3	46.8	30.0
19	49.2	29.5	47.7	31.0	46.8	29.9
20	49.7	29.9	47.3	29.9	46.8	30.0
21	50.9	22.9	* 46.7	* 28.8	* 45.5	* 27.3
22	51.2	28.8	46.2	27.8	44.2	24.7
23	50.7	26.3	47.1	29.4	43.8	26.5
24	50.6	27.7	48.3	29.9	44.3	27.3
25	50.5	22.5	47.7	30.0	46.1	29.8
26	51.3	27.7	46.5	28.5	45.7	29.9
27	51.0	29.0	44.3	21.4	45.0	29.3
28	51.3	28.1	46.2	27.6	44.5	28.8
29	50.7	28.1	46.2	26.9	45.9	29.8
30	51.0	28.2	46.2	26.8	45.2	30.2
31	50.7	28.5	0.0	0.0	45.0	29.9
MEANS	51.9	27.6	47.8	28.6	46.2	29.3
OBSVNS.	31	31	29	29	29	29
YRLY.MEANS..........					50.8	25.9
MAXIMUM	55.9	29.9	49.4	31.0	47.7	30.4
MINIMUM	49.2	22.5	44.3	21.4	43.8	24.7
STD.DEV.	1.81	1.70	1.16	1.92	1.06	1.23

Annual Graphs of the 7-day

Normally-weighted Running Means

for Temperature and Salinity

1974


LANGARA ISLAND 1974 TEMPERATURES
°F
70
65
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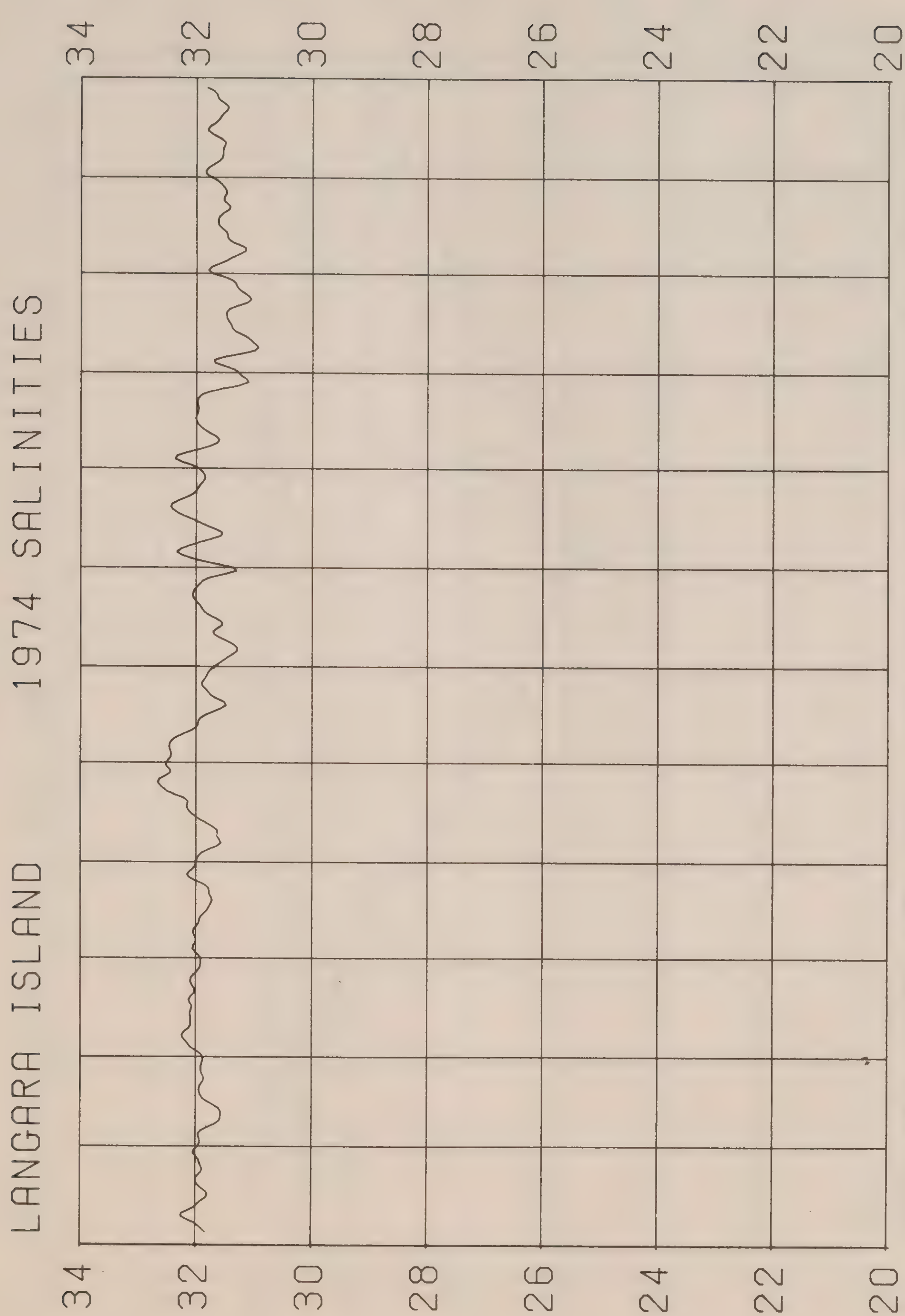
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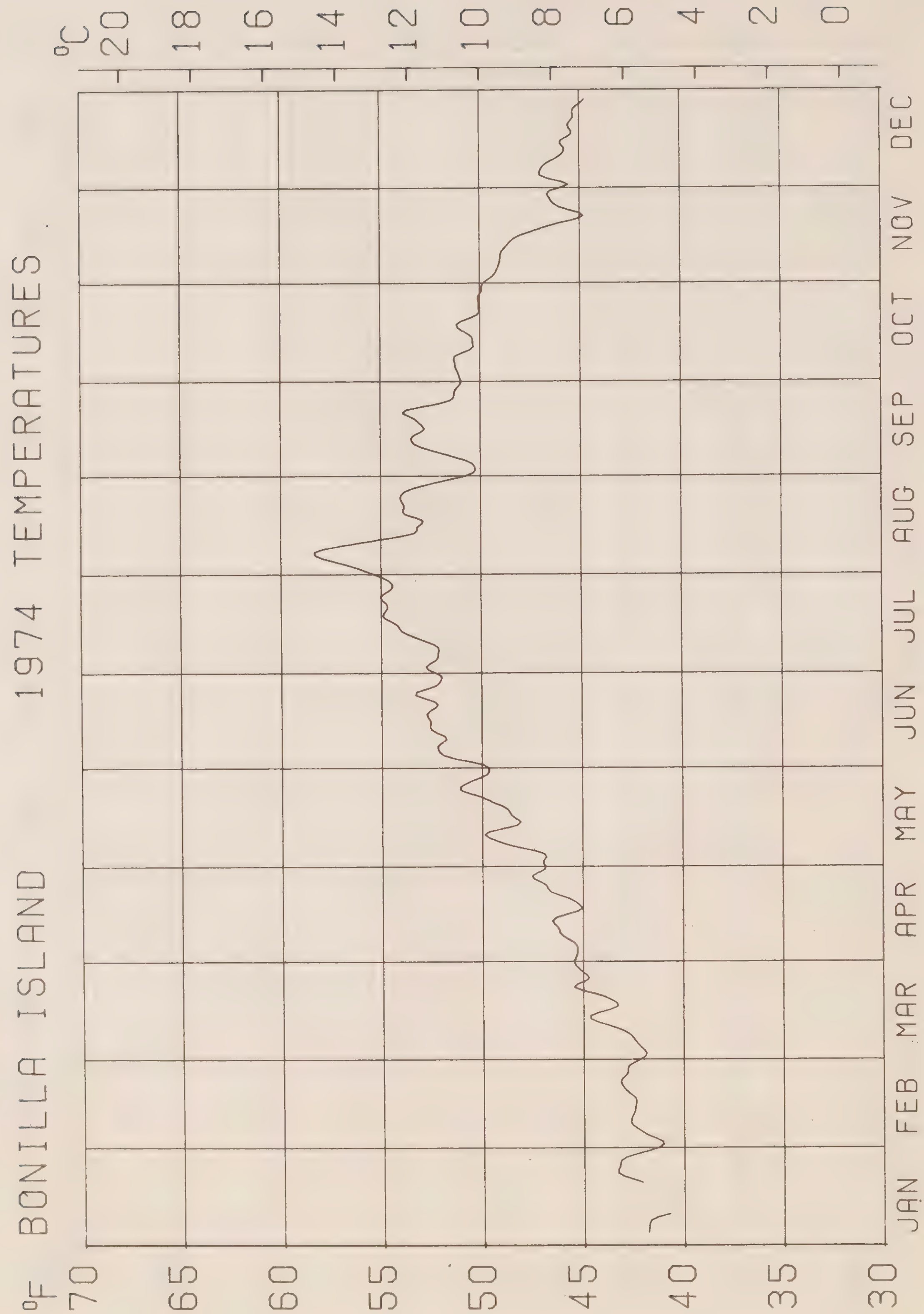
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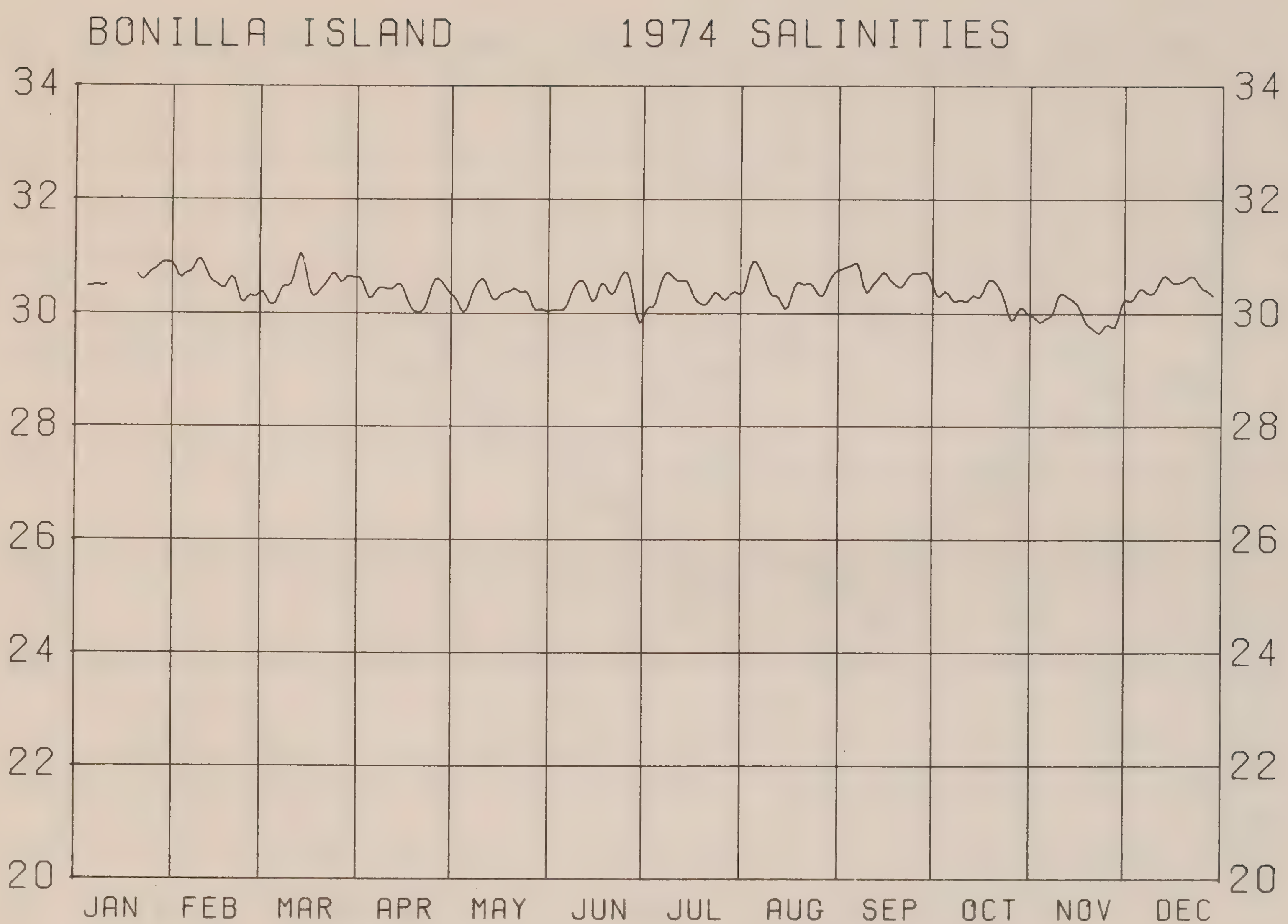
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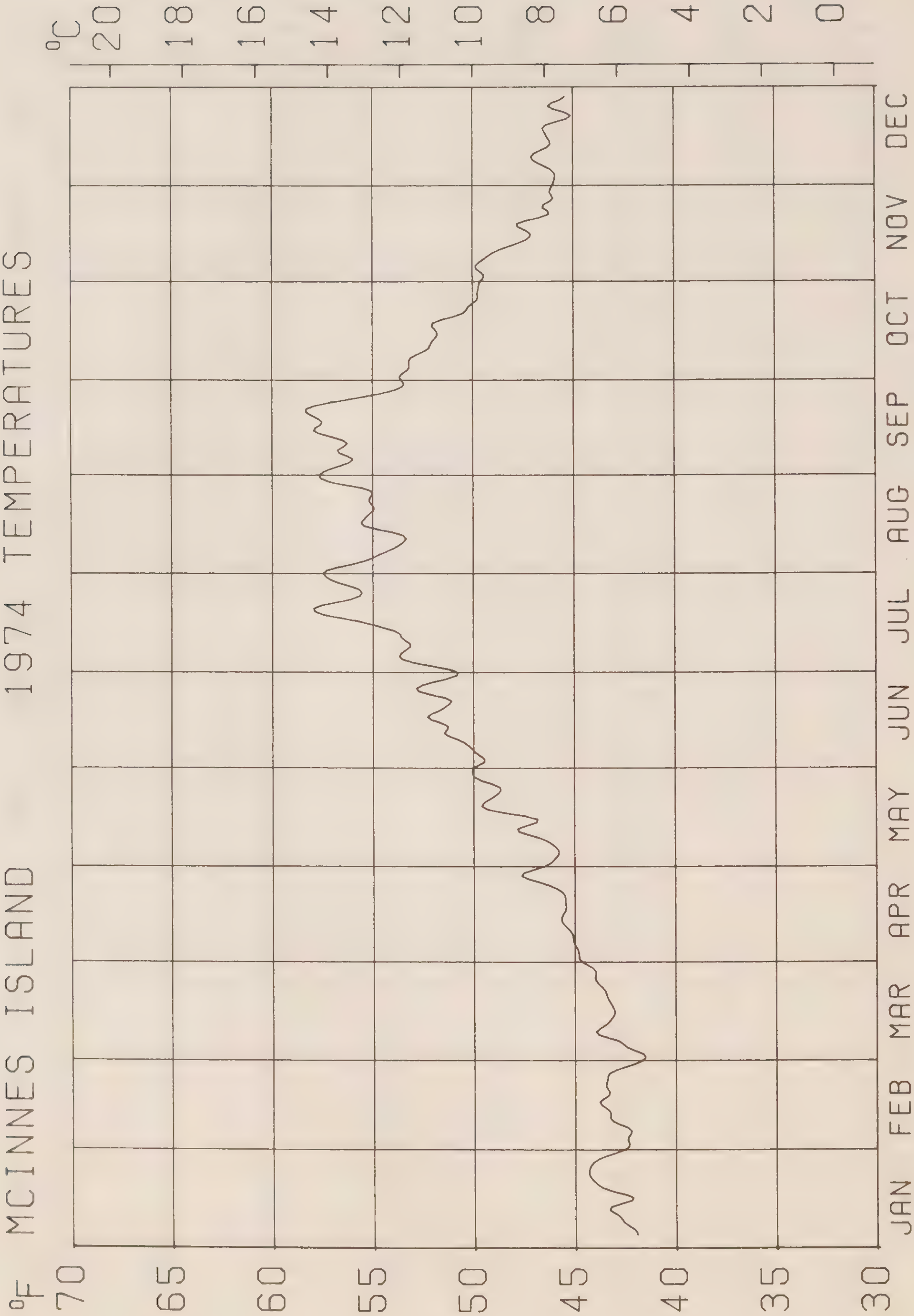
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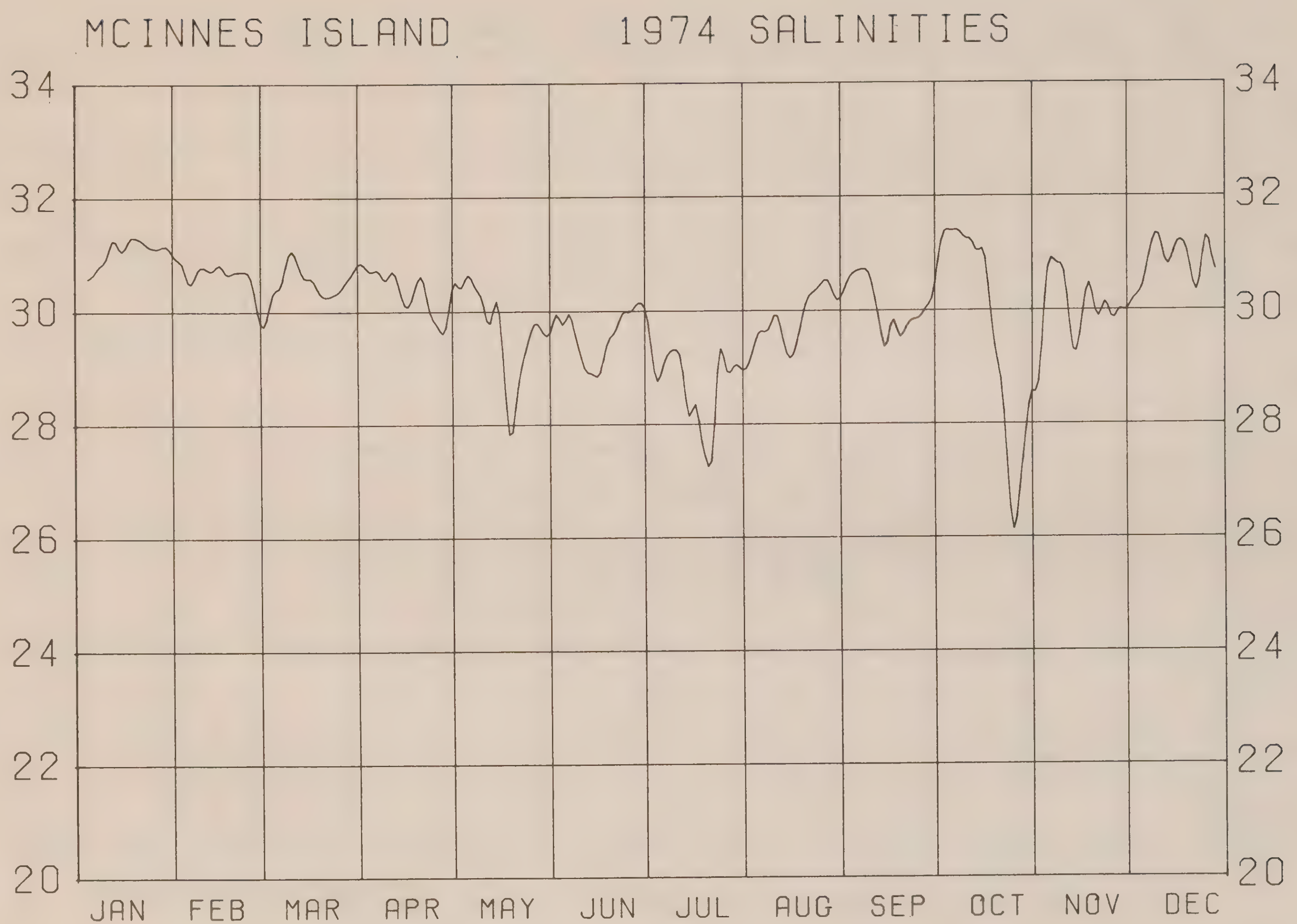
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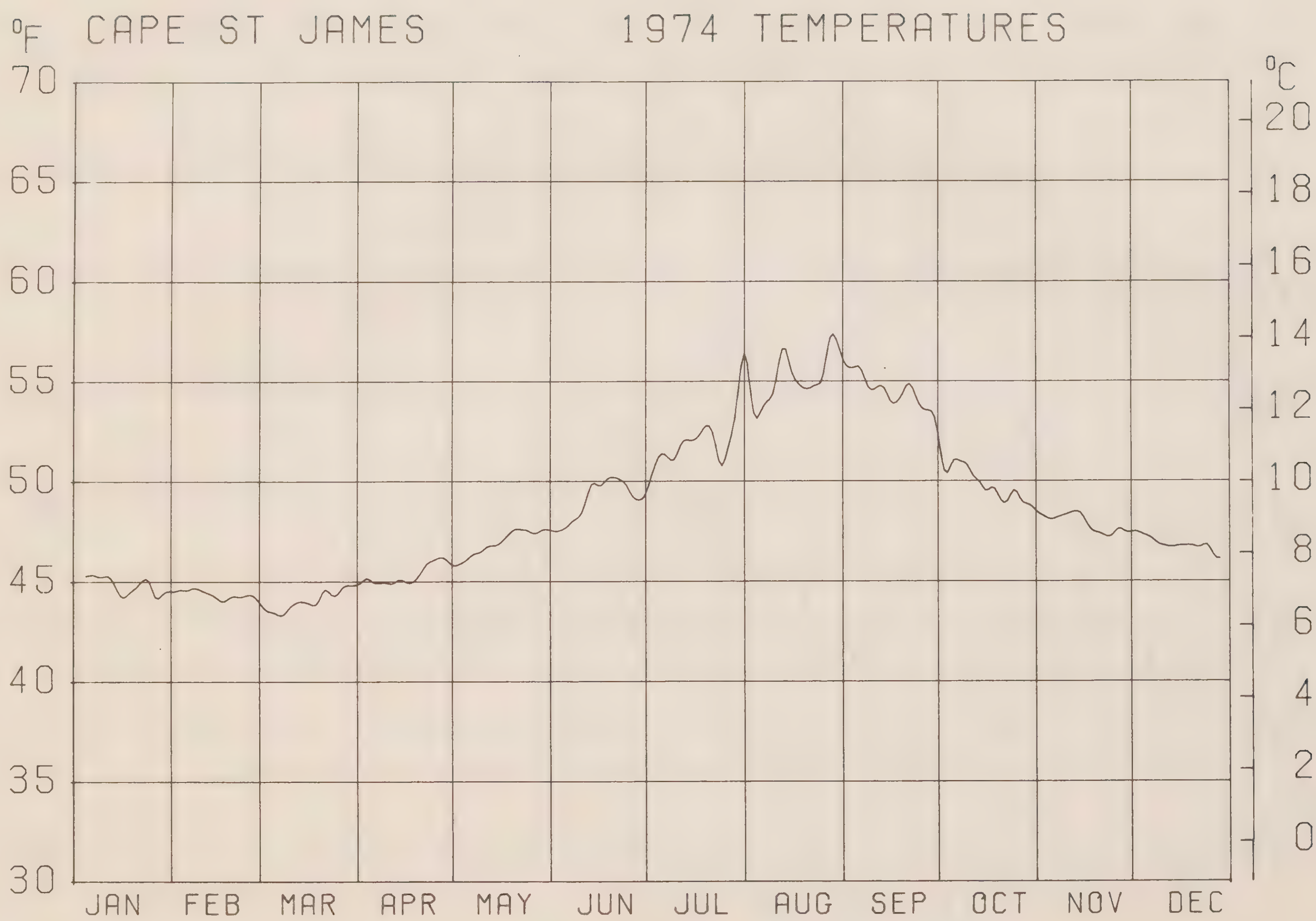
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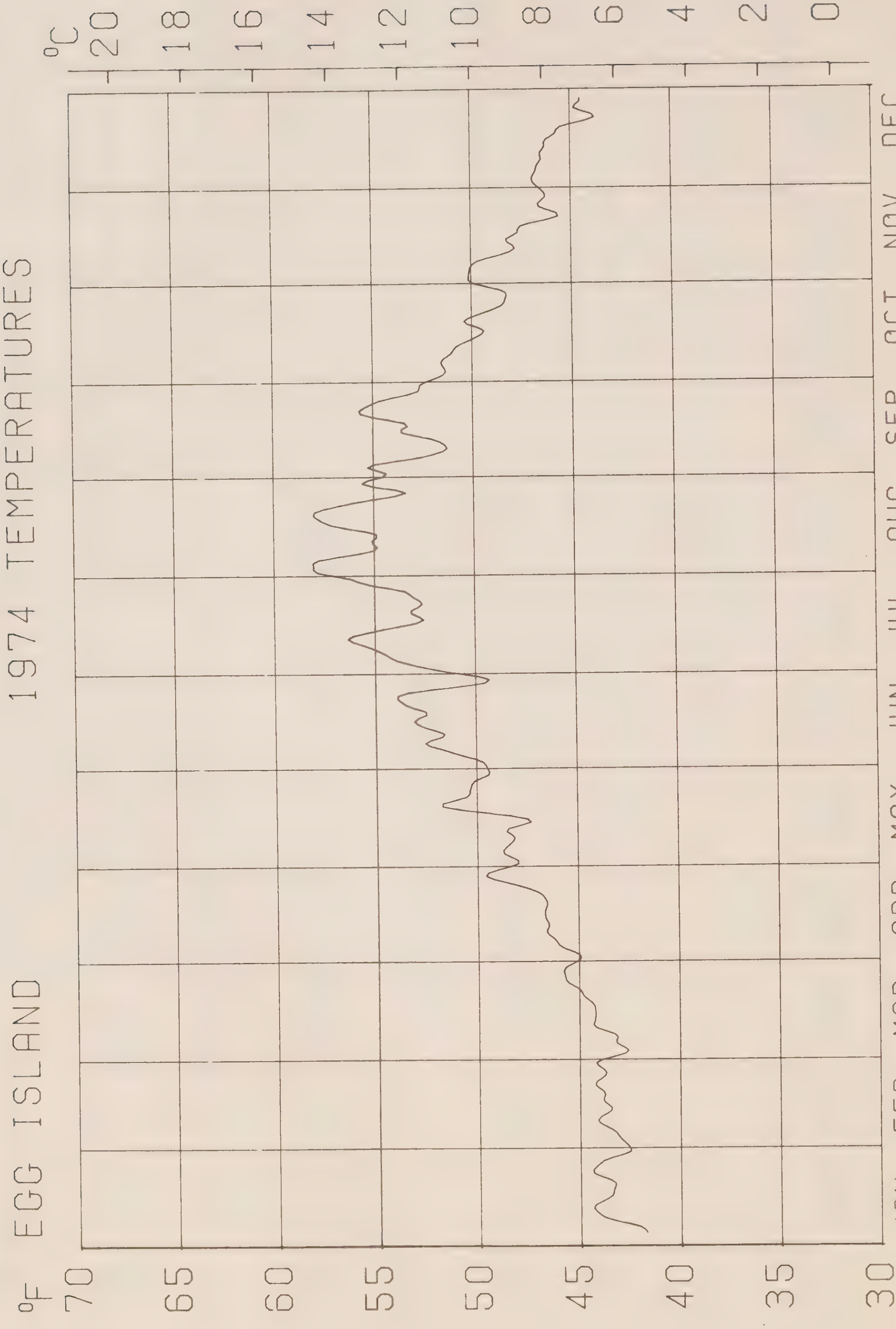
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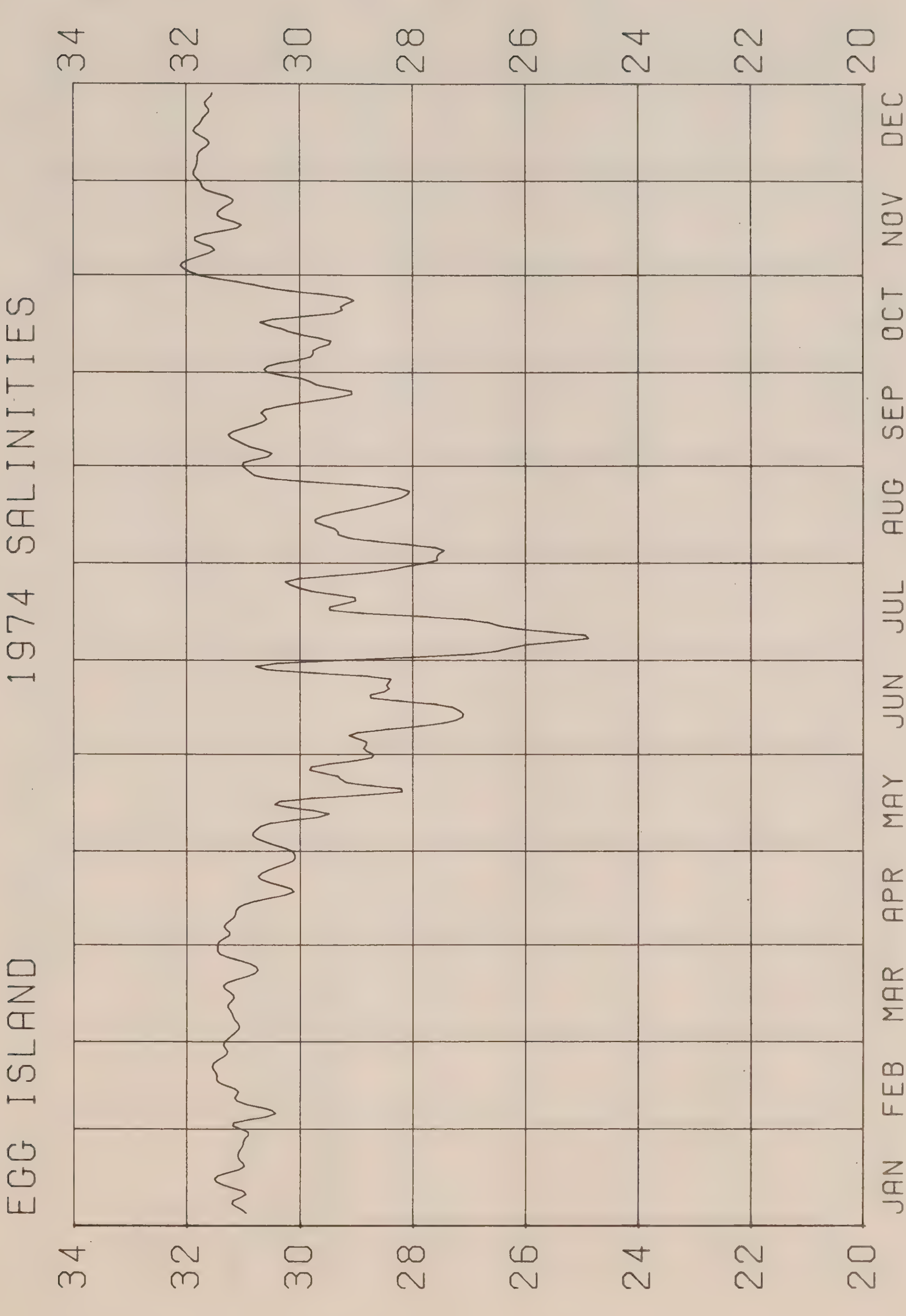
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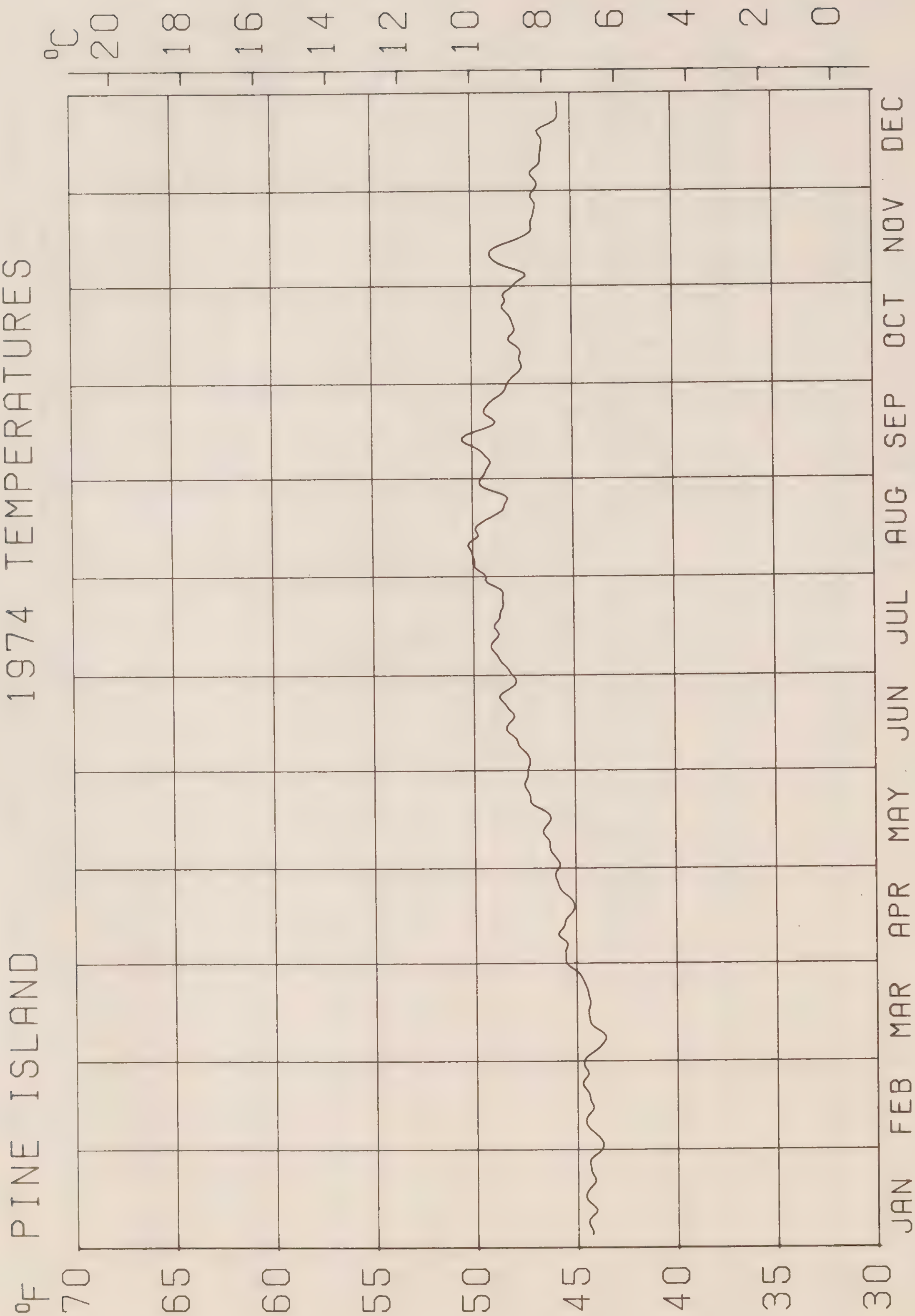
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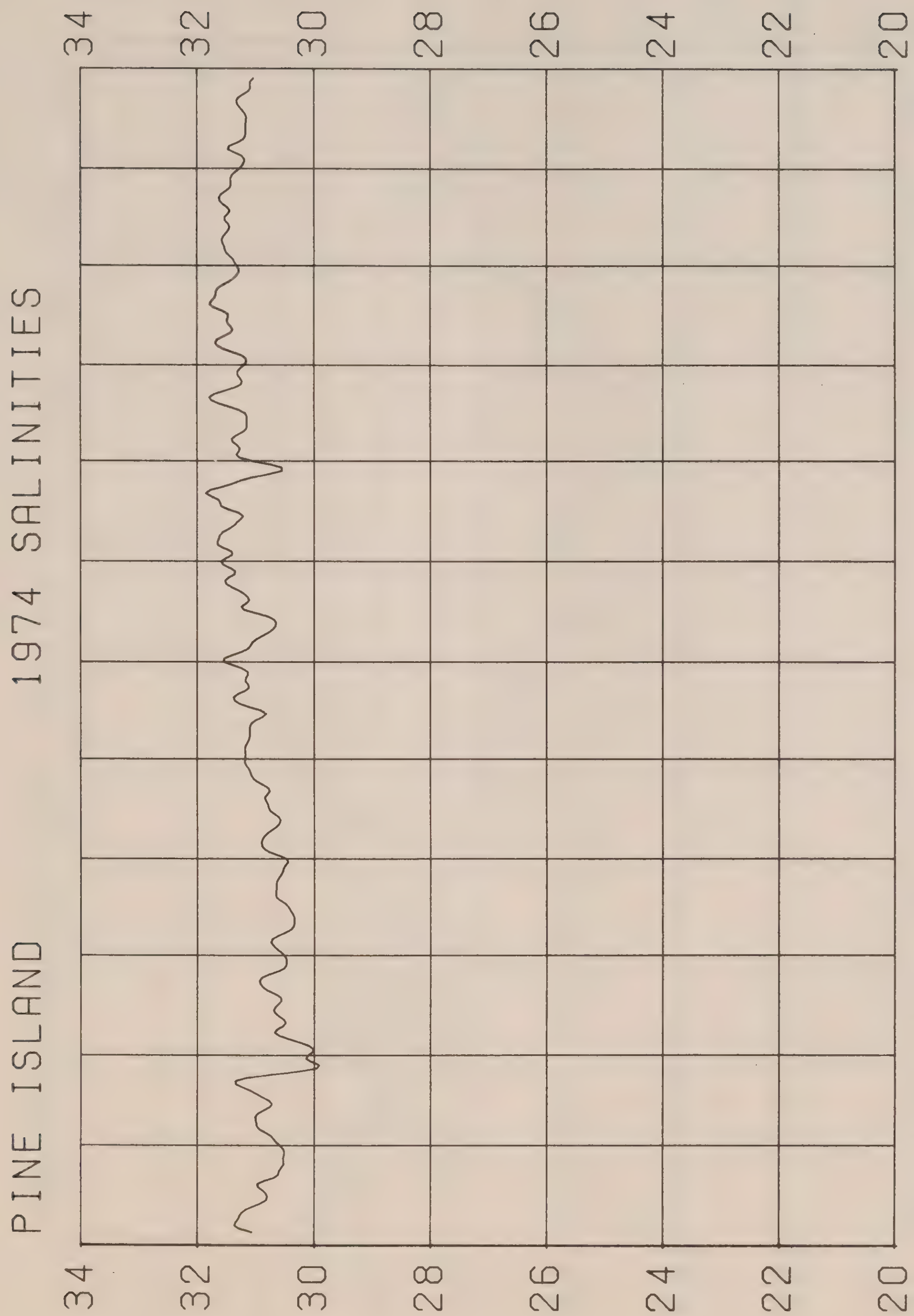

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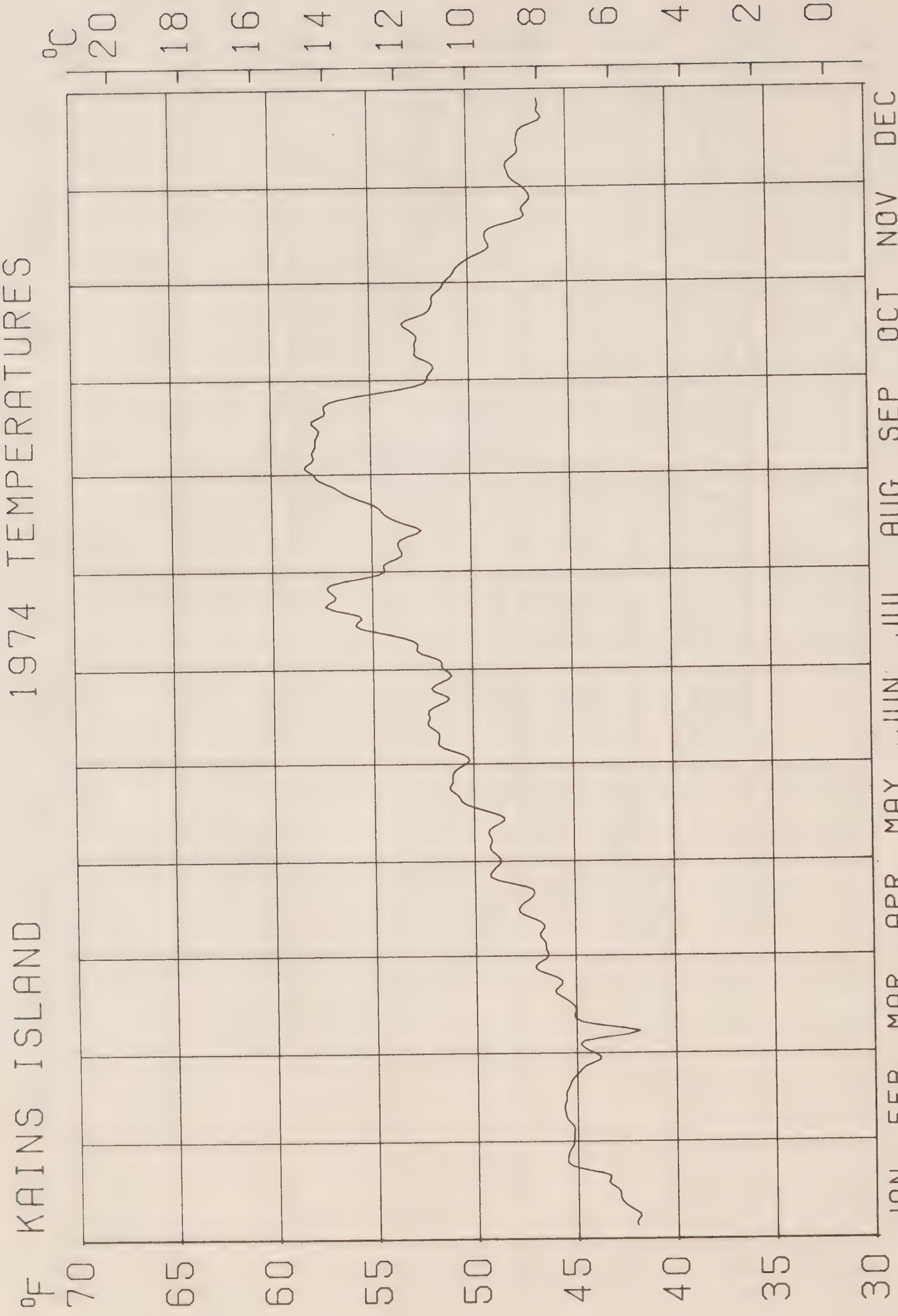
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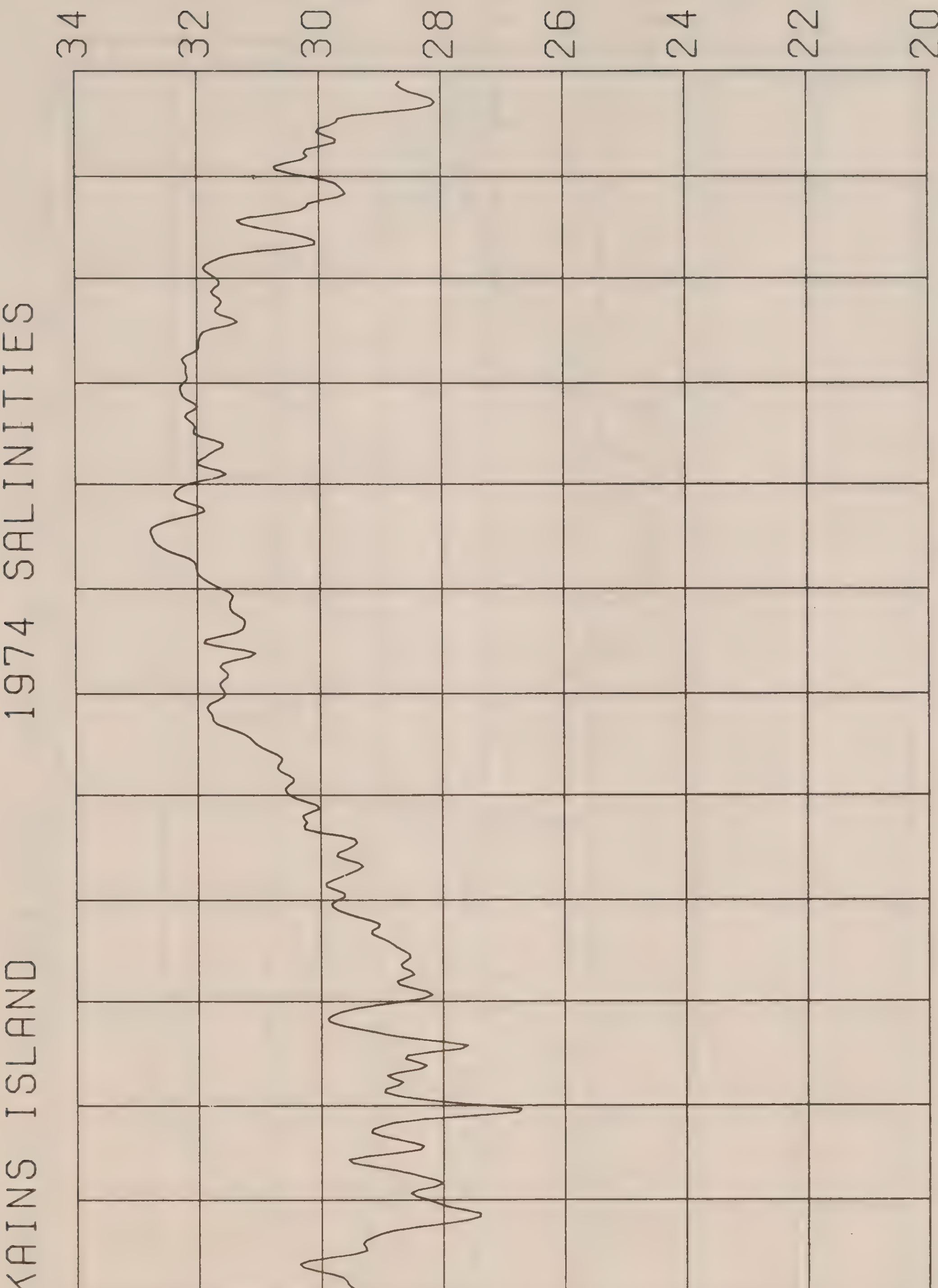
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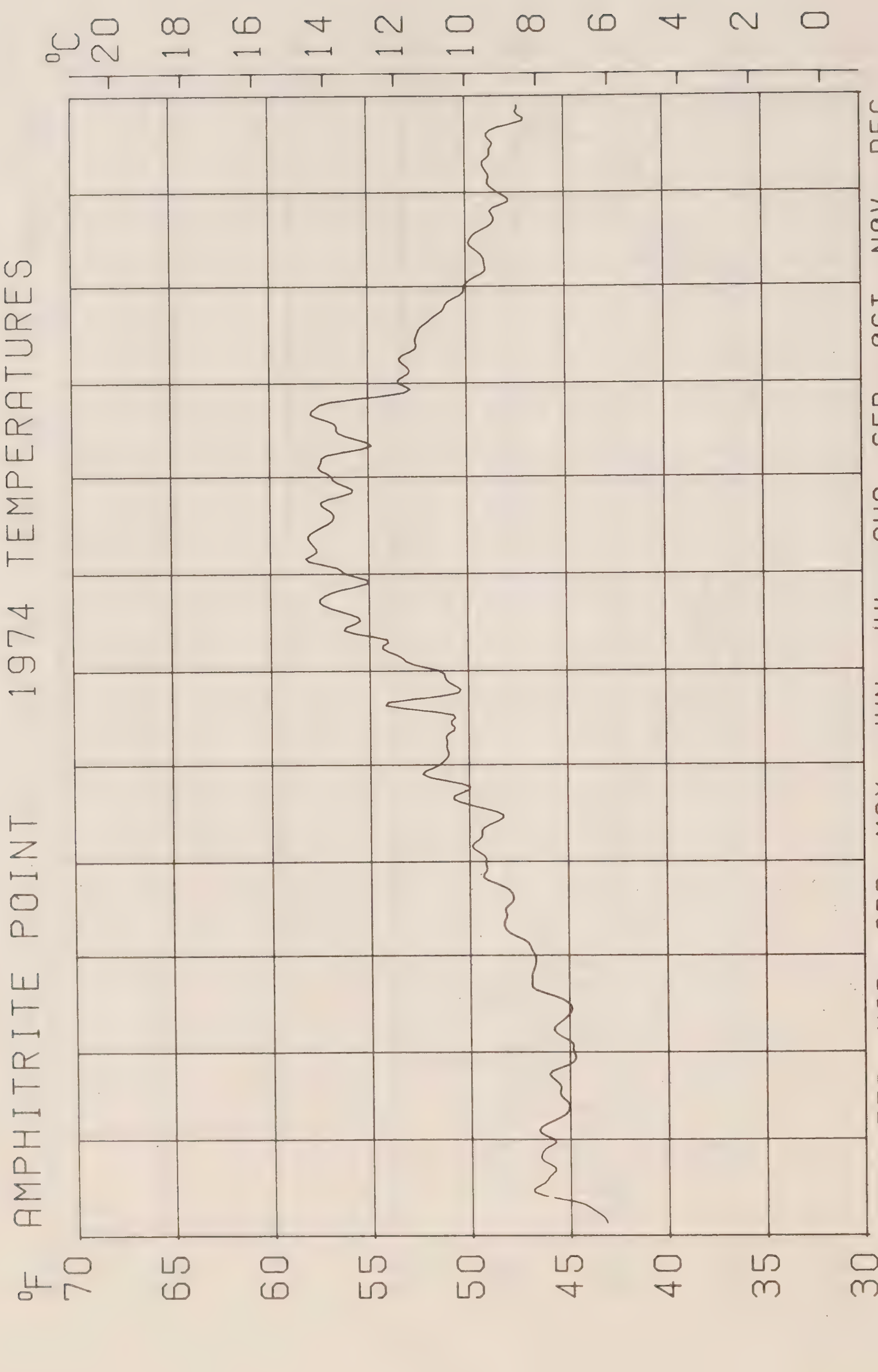

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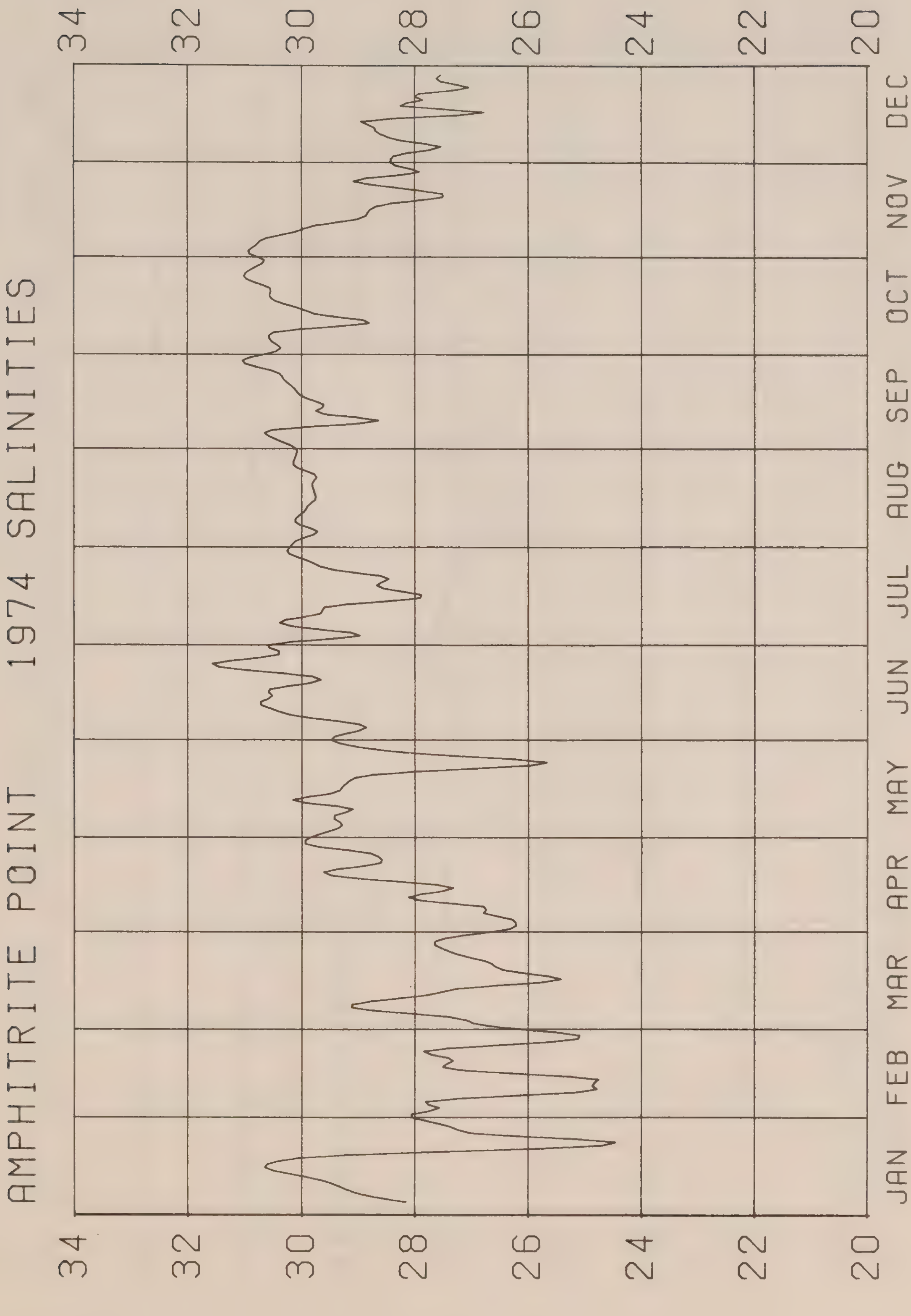

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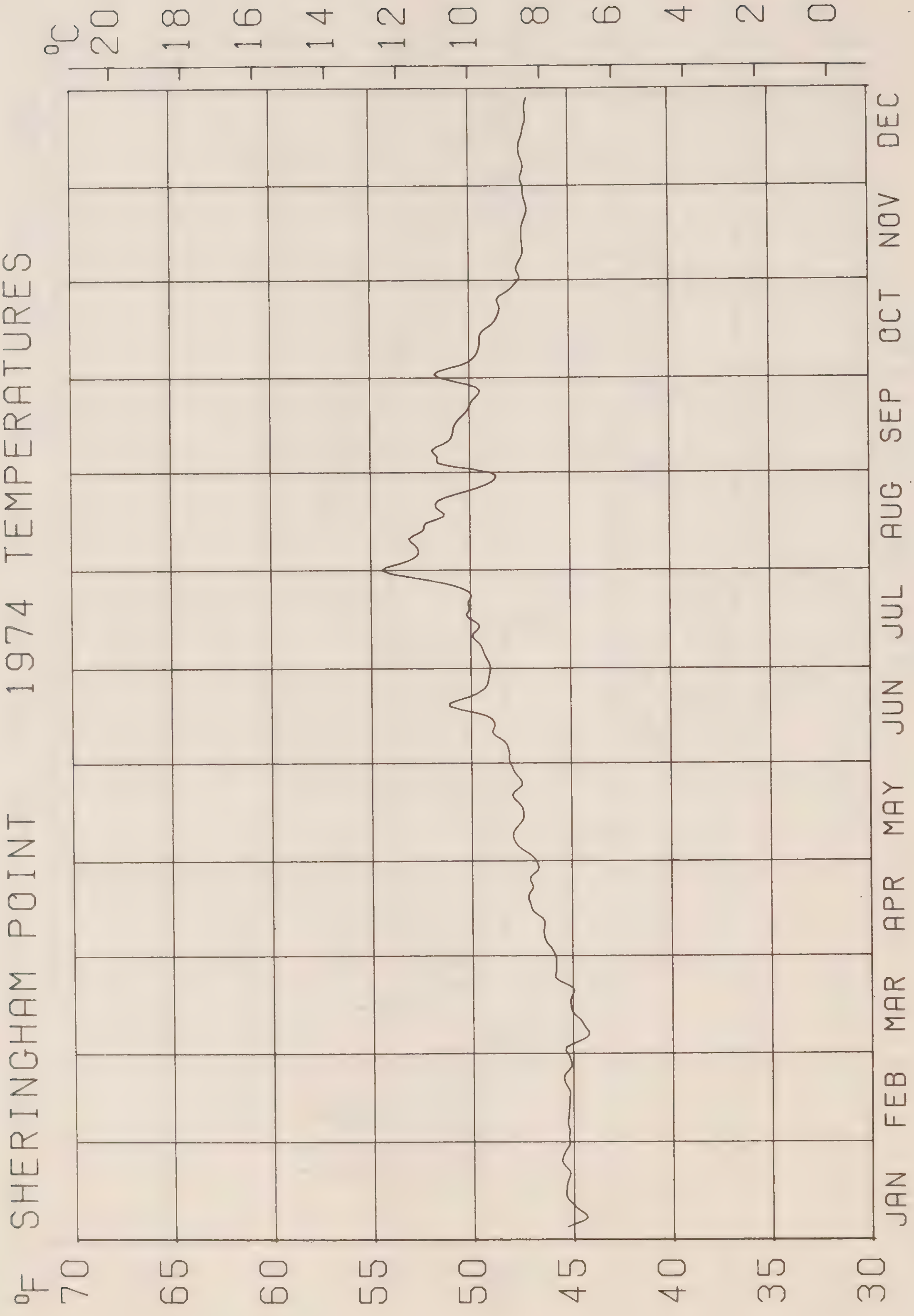
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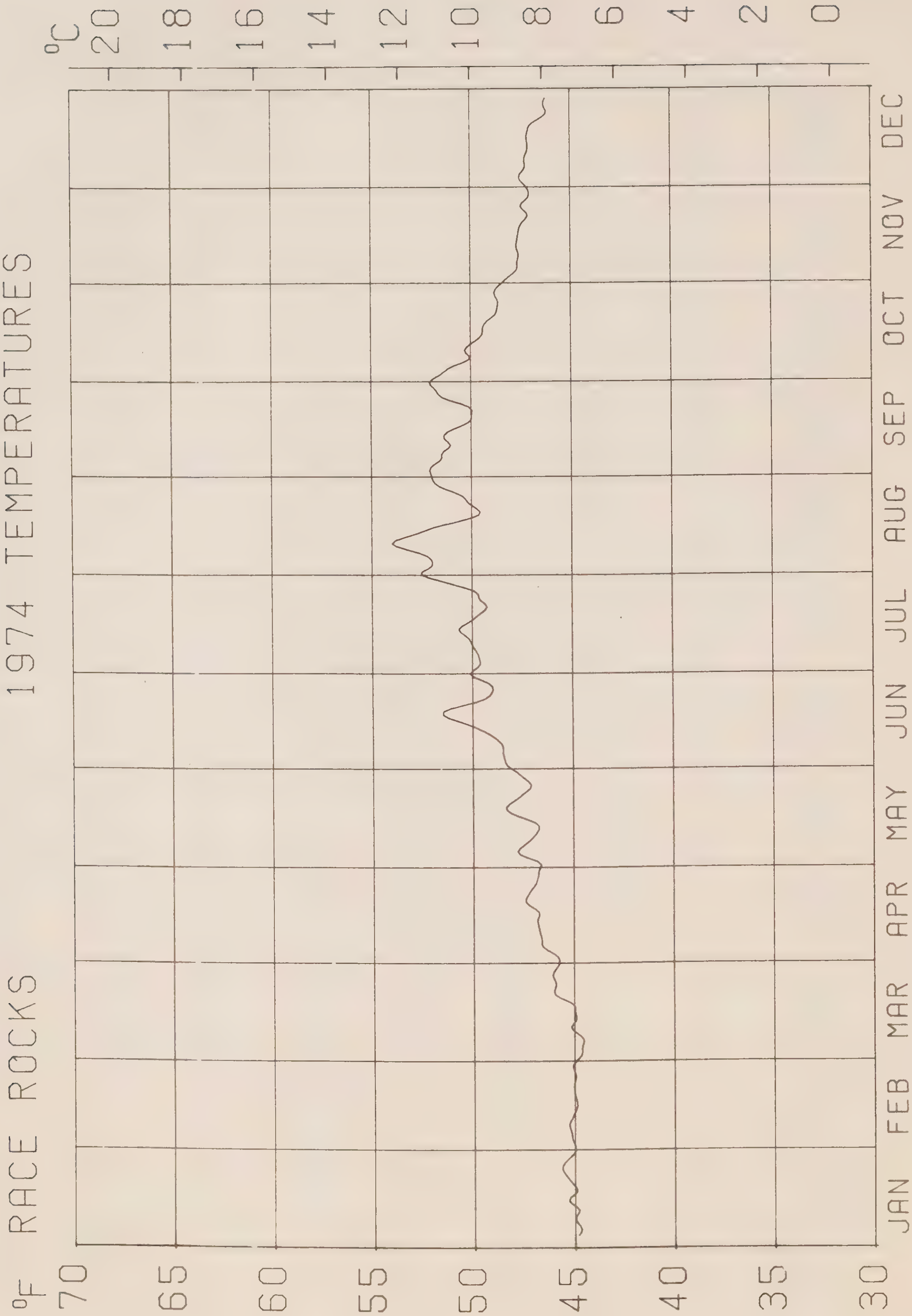
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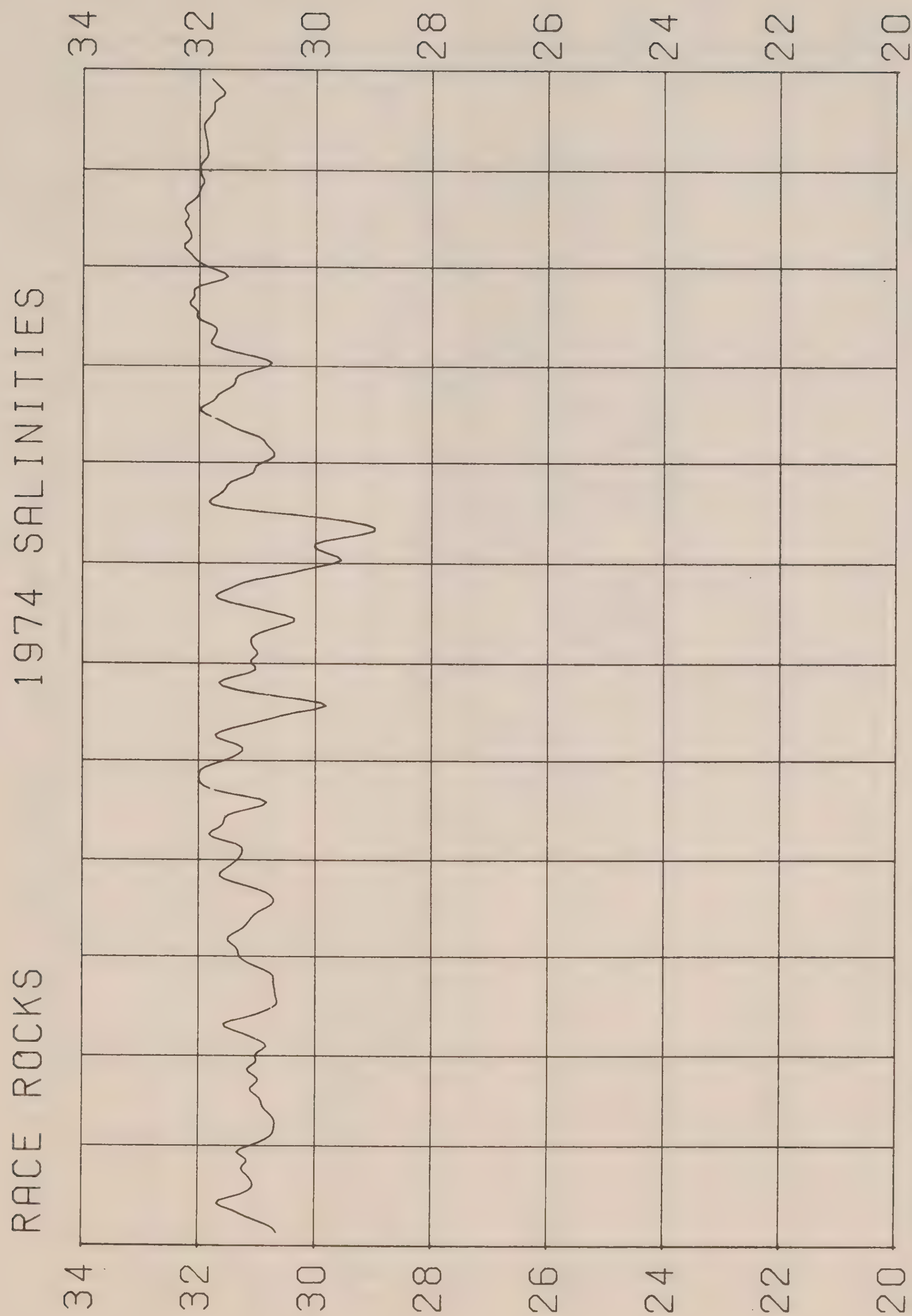
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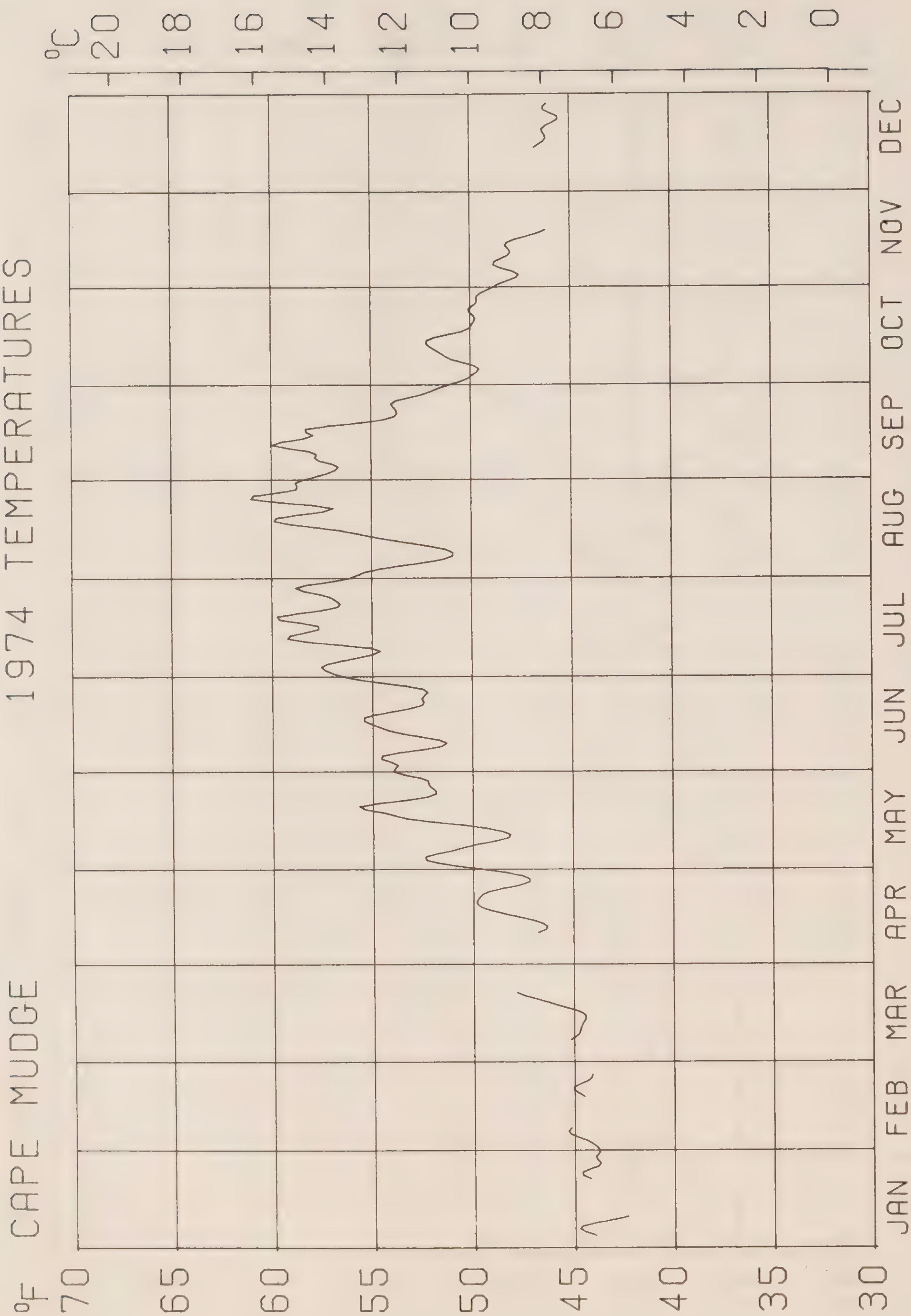
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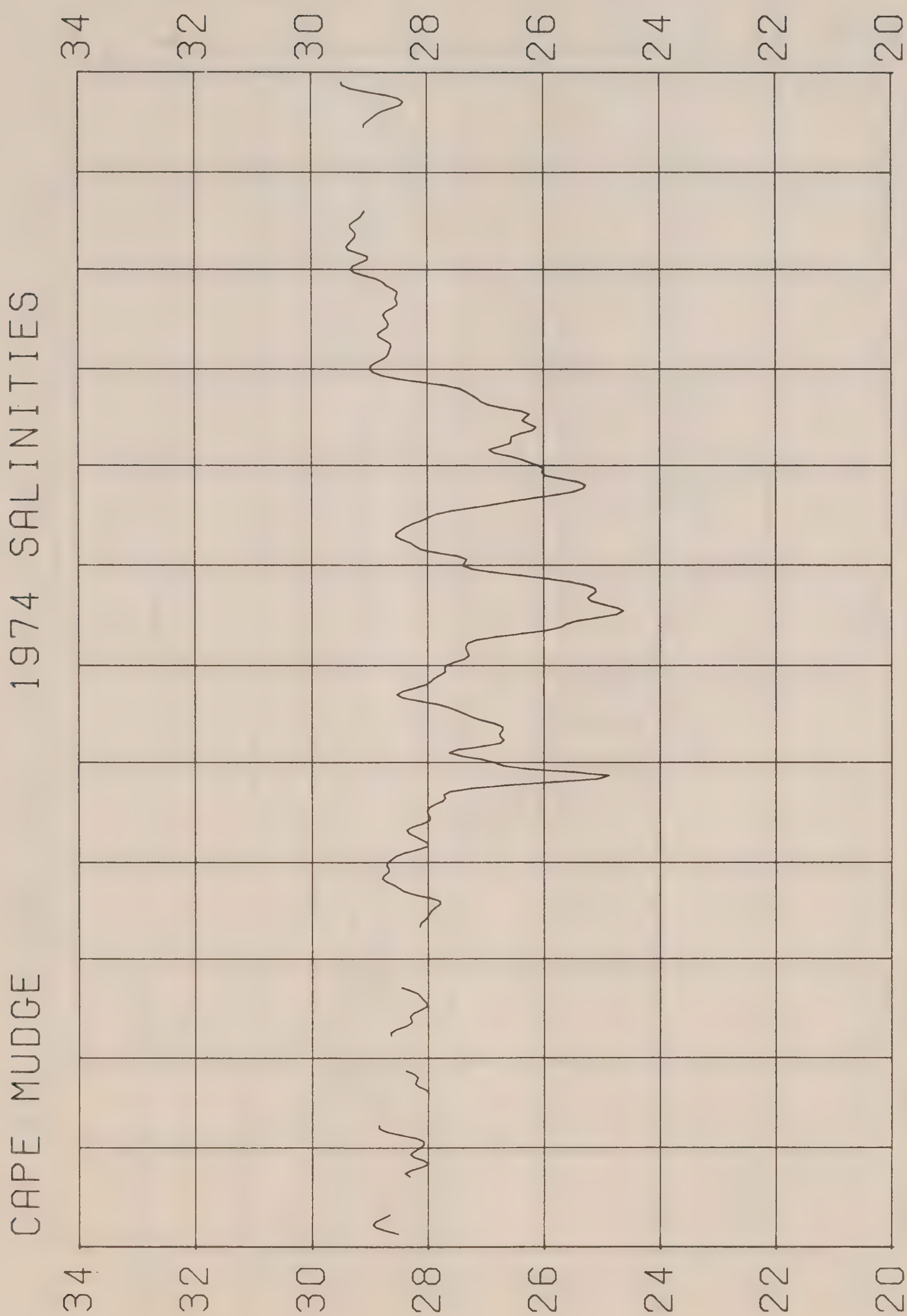
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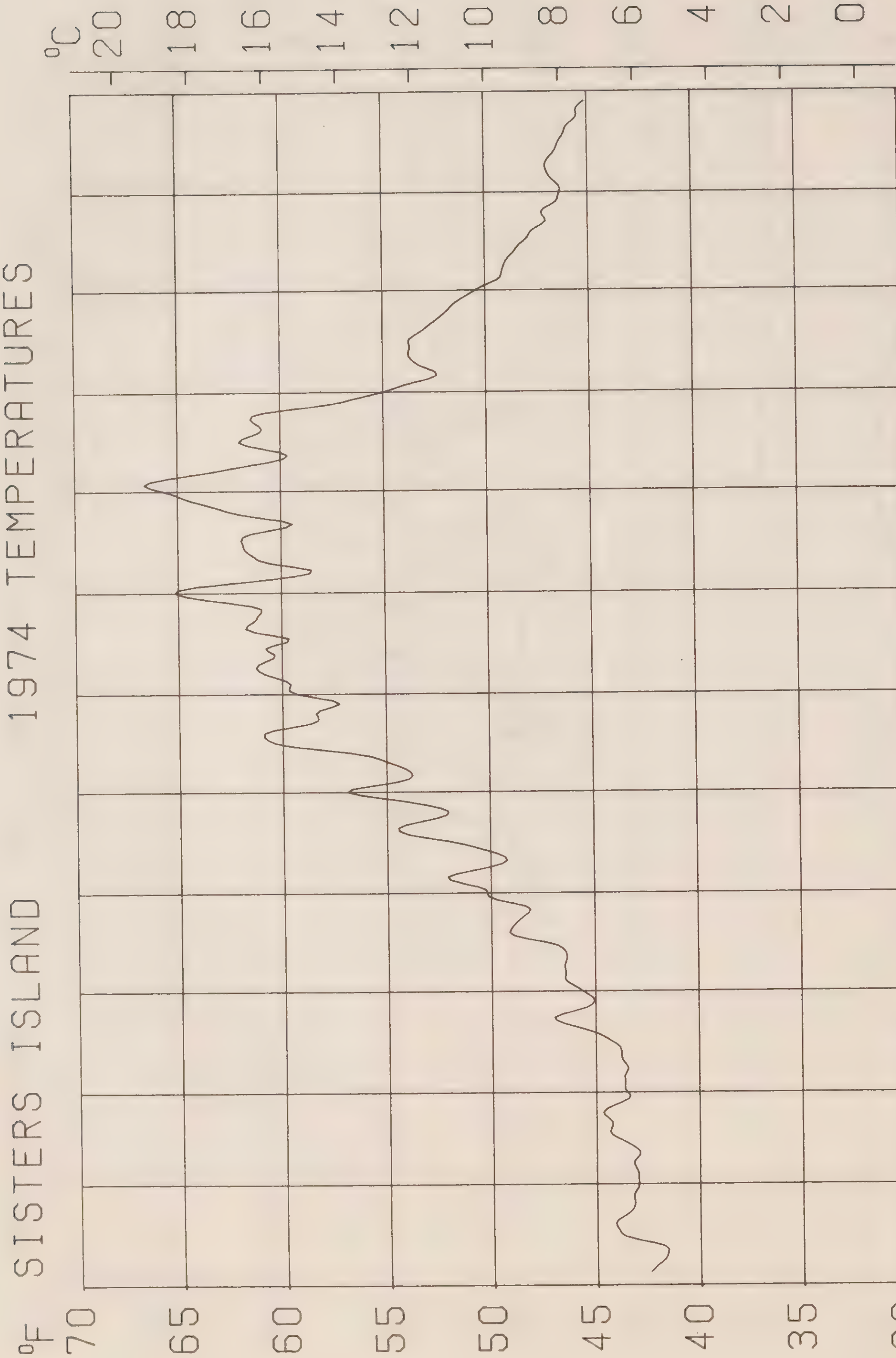
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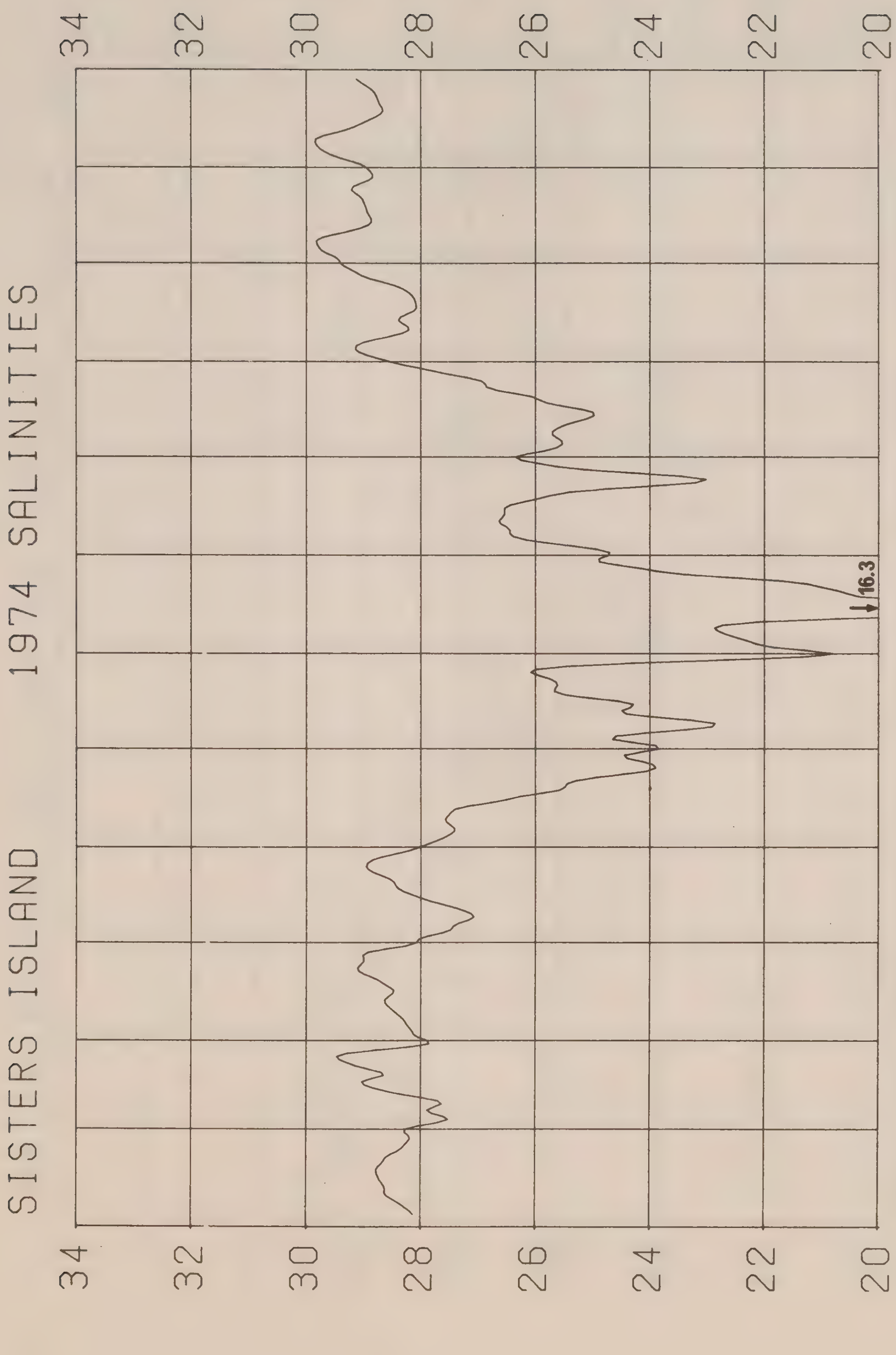
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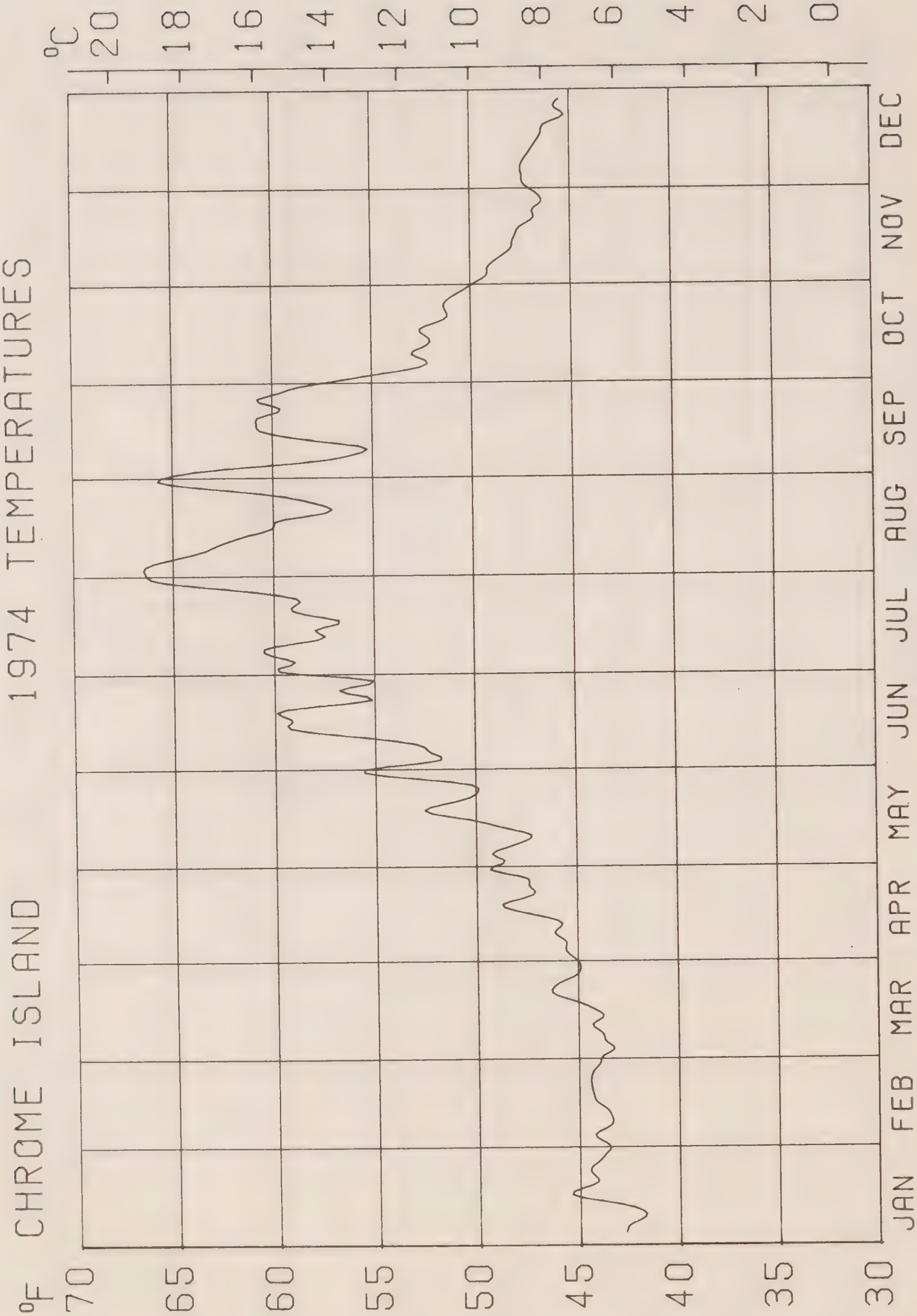
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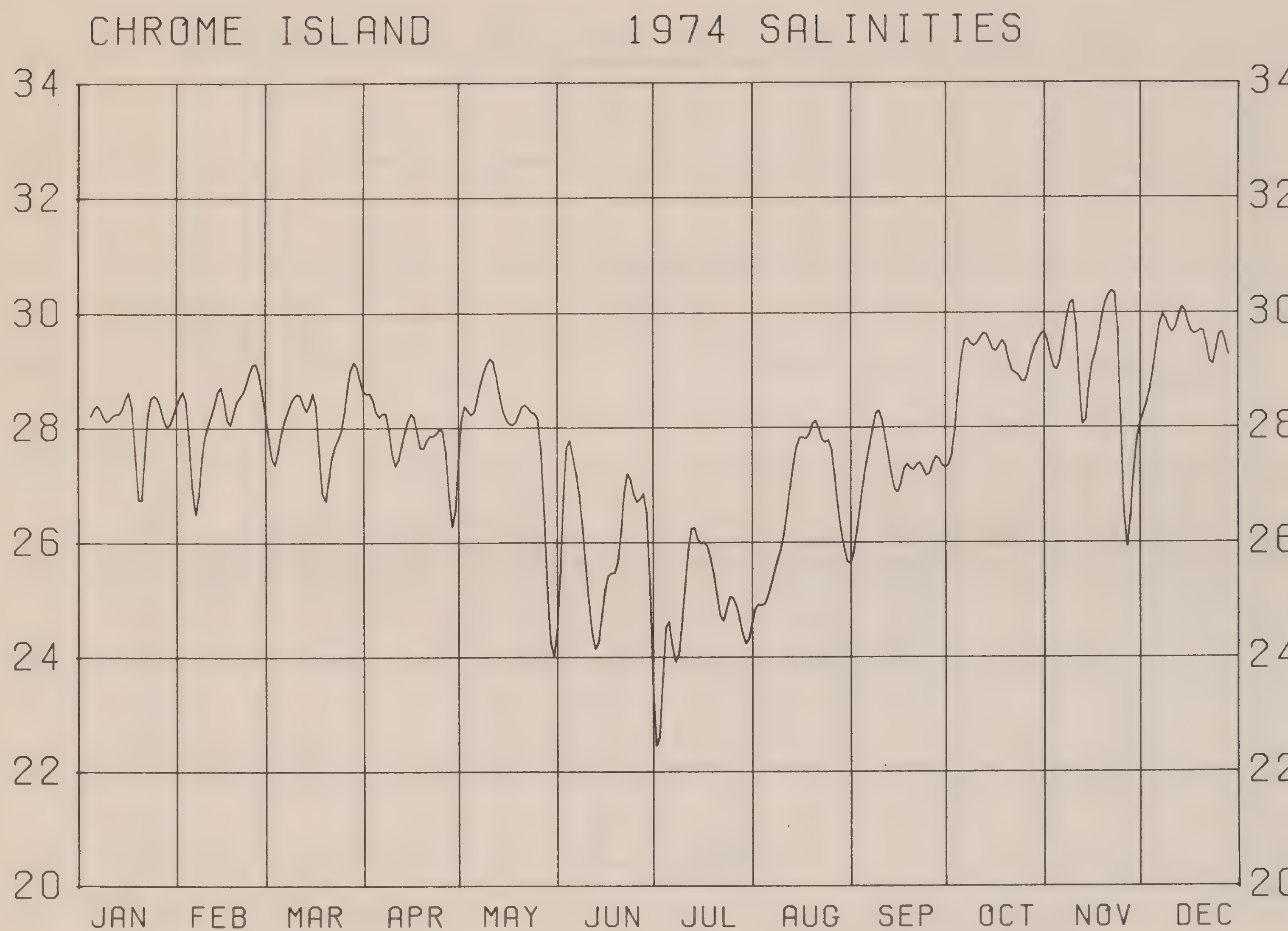
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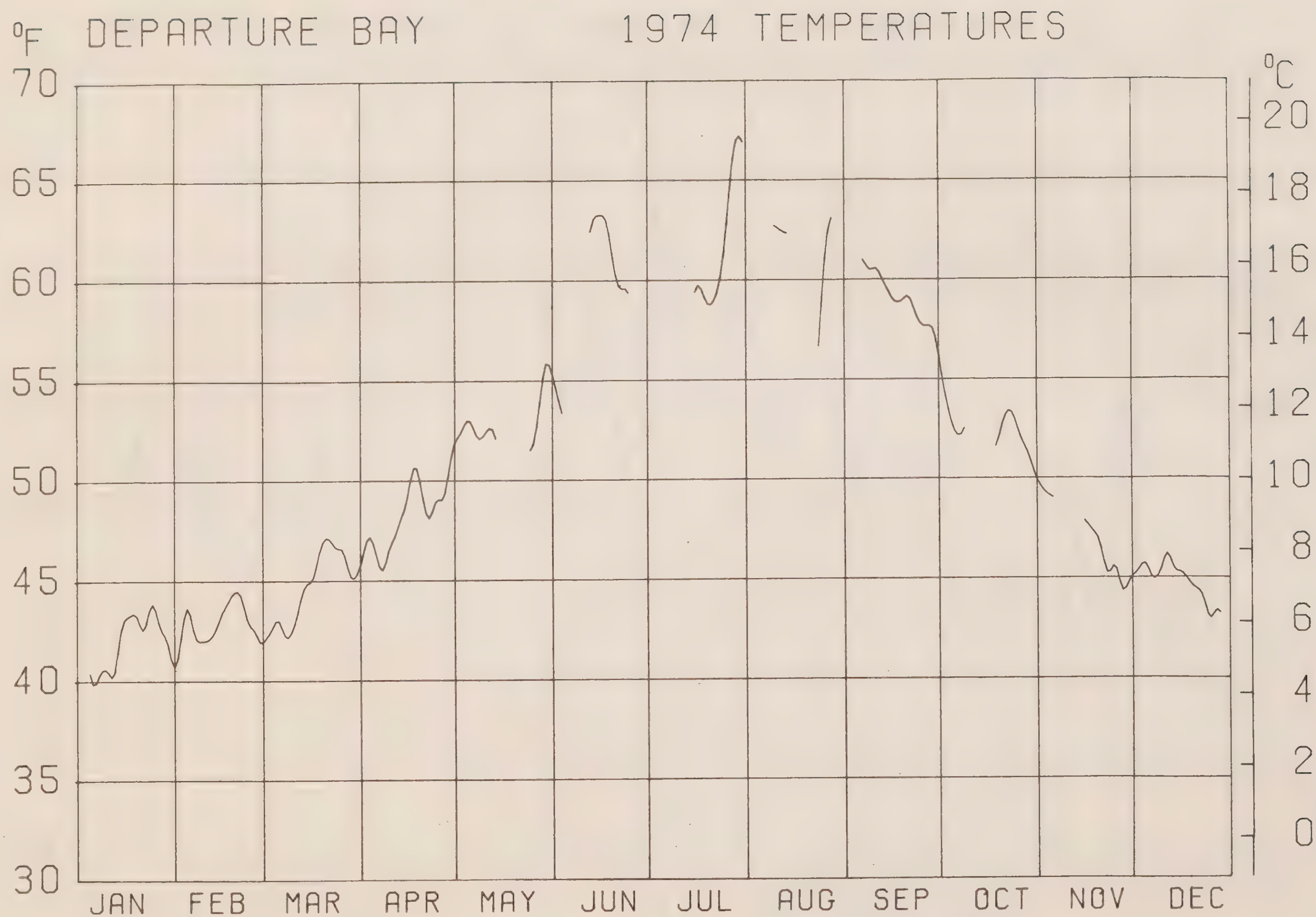
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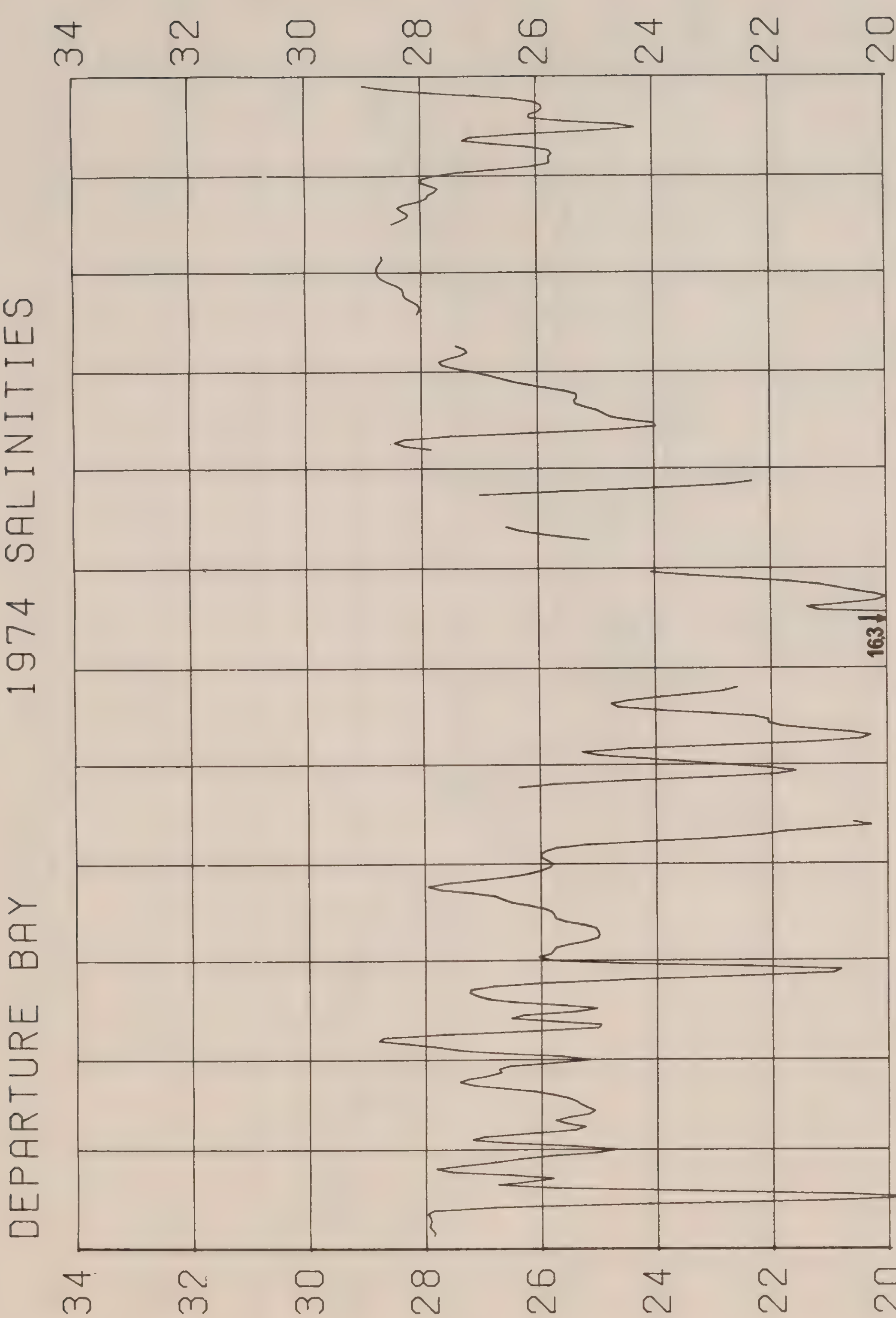
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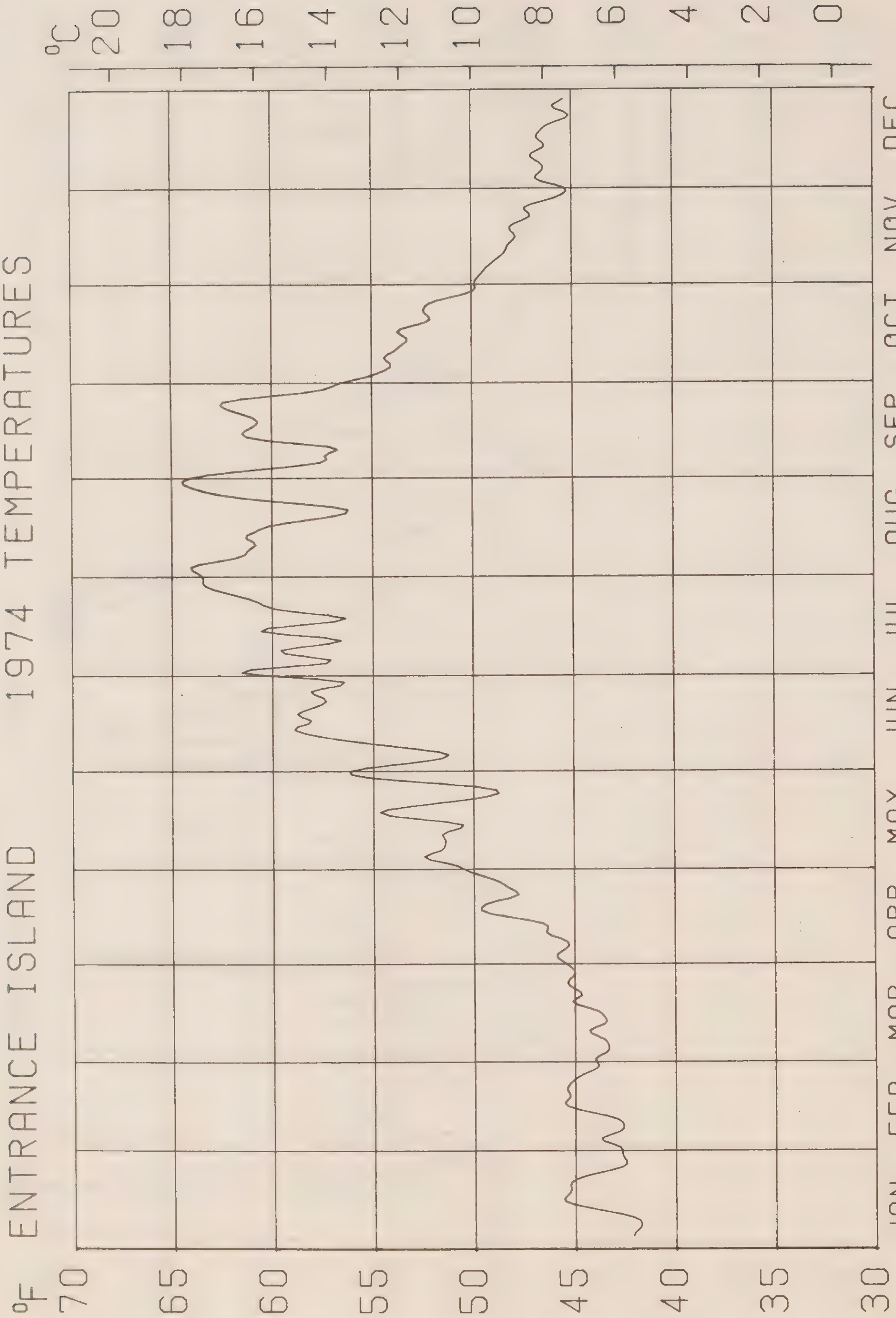
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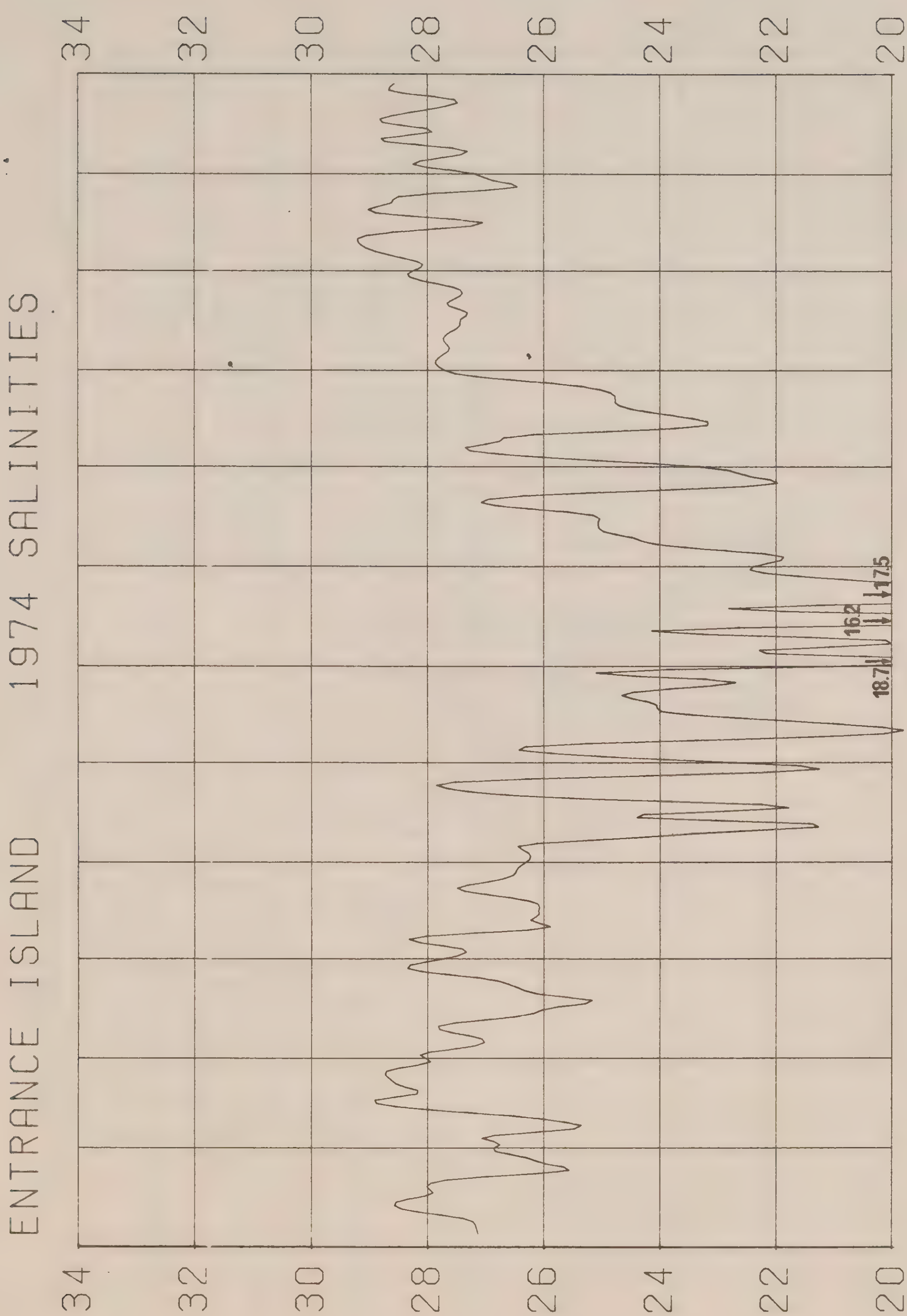
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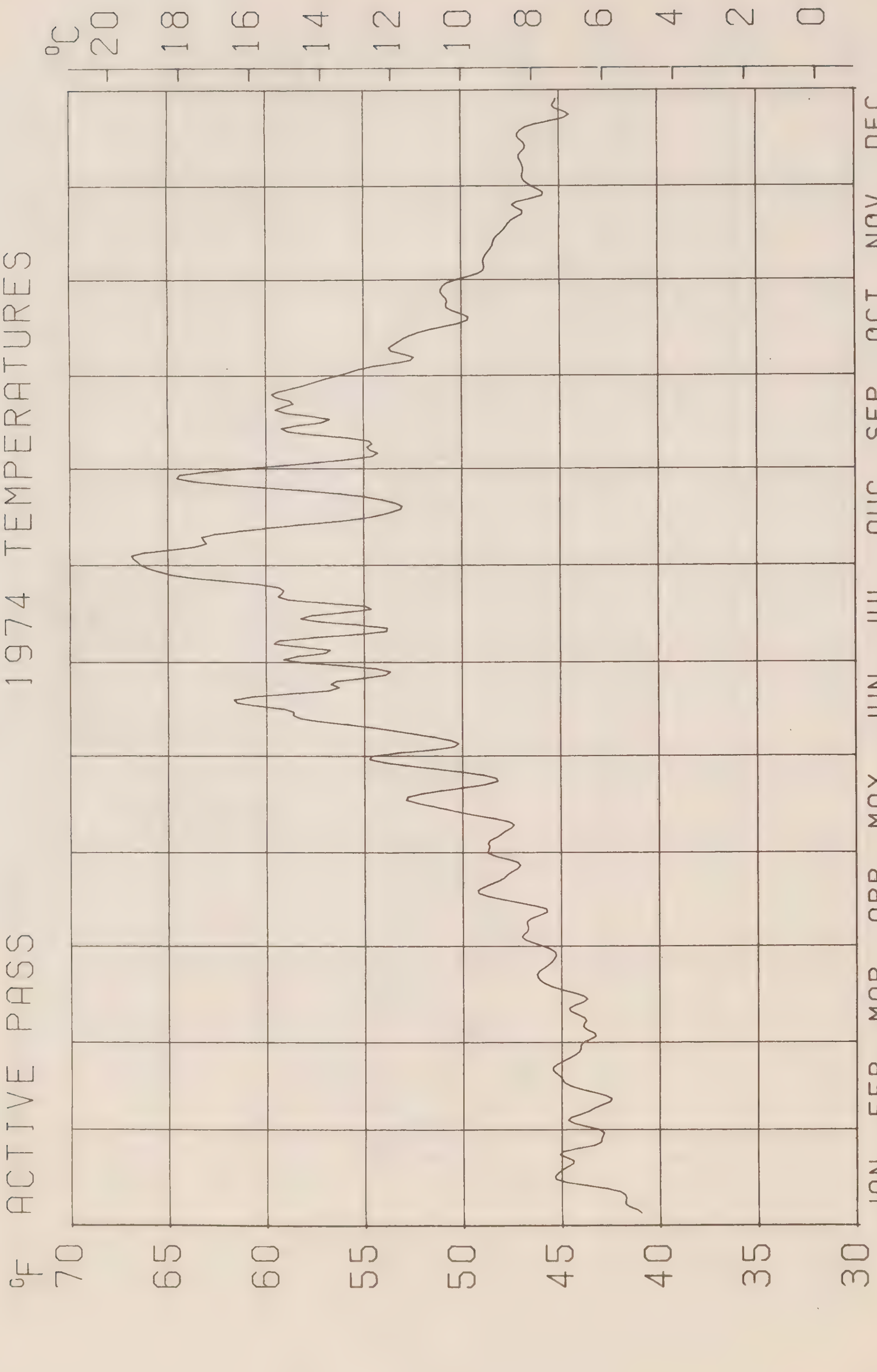
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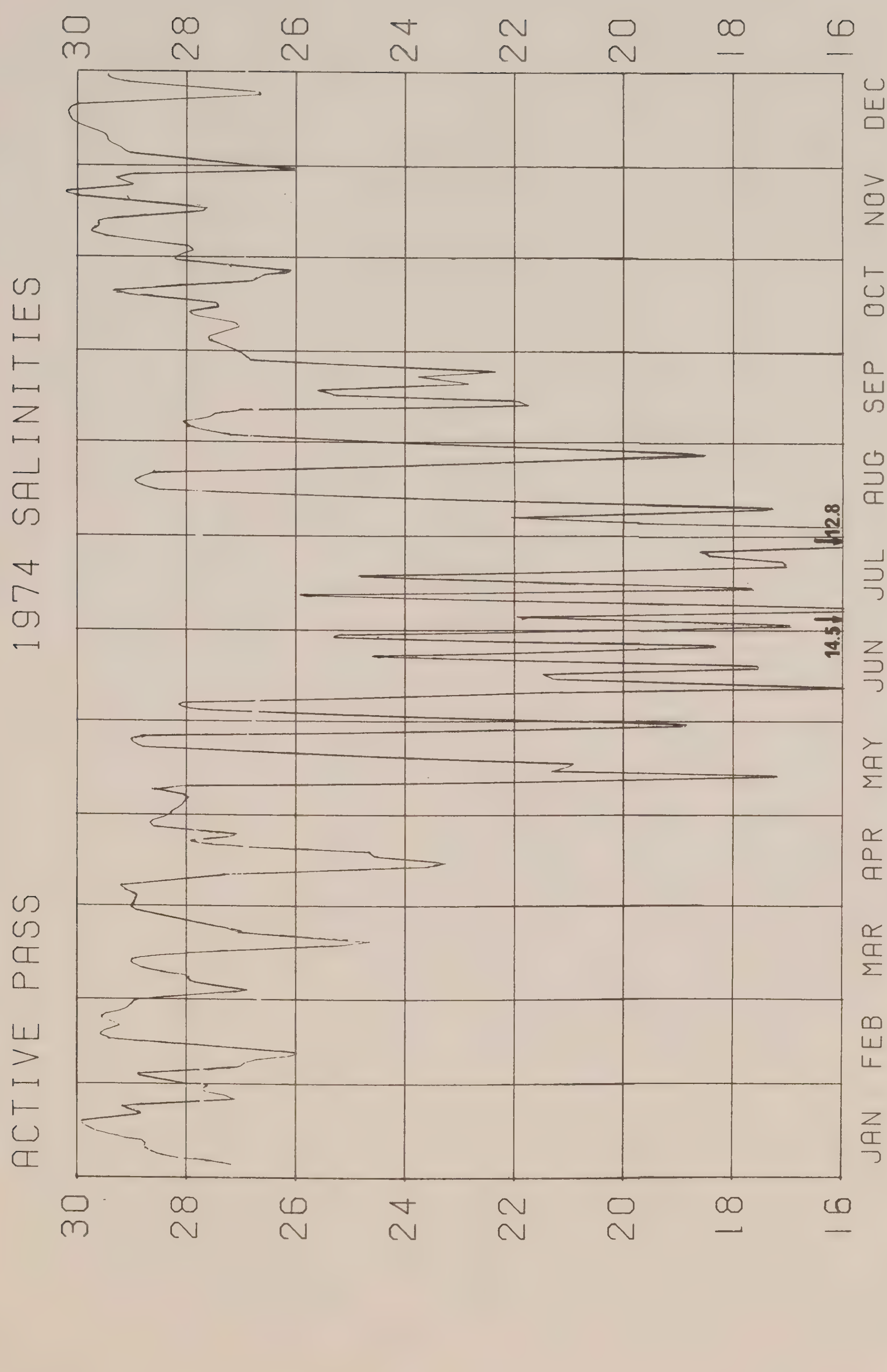
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Pacific Marine Science Report 78-3

Canada

AN EXAMINATION OF THE QUALITY OF SEA-SURFACE TEMPERATURES AND SALINITIES OBSERVED RECENTLY IN THE NORTHEAST PACIFIC OCEAN

by

S. Tabata

INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
Sidney, B.C.

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Sidney, B. C.
V8L 4B2

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Sidney, B.C.

January 1978

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ABSTRACT

Observations of sea-surface temperatures and salinities, made by a variety of methods during August and September 1975 off the Pacific coast of Canada, are examined to evaluate the quality of surface data. Salinity-temperature-depth temperatures are used as the reference (true) values, at least for the C.F.A.V. ENDEAVOUR cruise. The bucket method was found to be capable of providing sea-surface temperatures to an accuracy (standard deviation) of ±0.15°C. The thermograph/salinograph, when corrected by applying a "field-calibration" value, appears to give surface temperatures with a standard deviation half that obtained by the bucket method. Expendable bathythermograph-surface temperatures were, on the average, 0.3°C higher than the true values. Were it not for this offset, they would have been as accurate as those obtained with bucket thermometers. Engine-intake temperatures observed by the engine-room crew were on the average only 0.3°C larger than the true values but were characterized by large inaccuracies with standard deviation about an order of magnitude greater than those found for other methods. These variations are believed to be due to reading errors. Salinities determined with a laboratory salinometer are considered to represent true values. Sea-surface salinities observed with the bucket could be, with reasonable care, accurate within the limitation of the laboratory salinometer method aboard ships. The quality of data has been found to vary significantly between observers. Results obtained from this cruise and from weathership data (1956-1976) suggest that the surface temperatures and salinities observed during the past, 1956-1962, in the northeast Pacific Ocean have generally been overestimated.

1. Introduction

Sea-surface temperatures based upon merchant-ship observations have been widely used in synoptic weather forecasting and in studies upon fisheries (e.g. Owen, 1968; U.S. Nat. Mar. Fish. Service, 1977), climatology (e.g. Laviolette and Seim, 1969) and large-scale air-sea interactions (e.g. Namias, 1963). In recent years they have been used a great deal as ground truth for satellite observations (Brown, 1975) and as one of the source data in global, numerical atmospheric circulation models (Rowntree, 1972). These last two applications in particular demand temperatures that should be more reliable and accurate than we have been accustomed to in the past. Yet, even today the quality of the ship-reported temperatures still leavesmuch to be desired. For example, a recent examination of such temperatures observed in the north-east Pacific has revealed that they contain an appreciable amount of scatter --having mean standard deviation of ±1.5°C (Tabata, 1977a). Such a scatter is suggested in the results of previous studies (Brooks, 1926; Franceschini, 1955; Saur, 1963; Marcus and Smith, 1966; James and Fox, 1972; Collins *et al*, 1975; Tabata, 1977b) which implies that the quality of the ships' data has not improved during the past one half century.

Unless other means are found, the field calibration of satellite-observed sea-surface temperatures will still be largely dependent on the ship-reported data. Yet, with the data characterised by such scatter it would be difficult to obtain calibration that would yield useful satellite-observed temperatures. In the case of sea-surface temperature anomalies used in numerical models, it has been shown that even an anomaly of a few degrees in one part of the ocean, such as the tropics, can cause an anomalous atmospheric circulation not only in that part but also in another part of the globe (higher latitudes) as well (Rowntree, 1972; 1976). When such a "small" anomaly is being considered it is important to know that this is based on reliable data and not on those obtained by biased measurement systems such as might have been obtained by poorly-calibrated engine-intake thermometers.

In view of these problems just mentioned it appears worthwhile to examine the quality of the sea-surface temperatures as currently being observed. It is appropriate to start such an examination based on temperature data collected from oceanographic research ships as they are observed with more care than aboard other types of vessels. The present study is an attempt to make a start in this direction and is an examination of the quality of sea-surface temperatures collected using a variety of techniques from one such ship.

For air-sea interaction studies, sea-surface salinities are perhaps not as important as are the corresponding temperatures. However, these salinities are of significance to investigations in fisheries and in ocean climatology. Yet, there has been practically no study previously made except at Station P (Tabata, 1977b), to determine the accuracy of the salinity data. The present study therefore includes an evaluation of sea-surface salinities observed by the use of a variety of methods.

2. Data and Methods of Observations

During the period, 19 August through 10 September 1975, an oceanographic cruise was made off the Pacific coast of Canada by the research ship, C.F.A.V. ENDEAVOUR. Hereafter generally referred to as "the (ENDEAVOUR) cruise", this exercise provided an opportunity to acquire the data necessary for the comparison of the sea-surface temperatures and salinities observed by a variety of methods.

a *Bucket Method*

This method was utilized either just before the ship came to a full stop at a hydrographic or salinity-temperature-depth (STD) station, or while the ship was underway at full speed during expendable bathythermograph (XBT) cast. A rubber bucket of approximately 5-litres (ℓ) capacity was lowered over the side of the ship and a sample of seawater collected. The bucket was rinsed with this water; the procedure was repeated two times before the actual sample was obtained. A salinity sample bottle (200-ml capacity) and its stopper were rinsed immediately three times with this water before being finally filled. If the bucket was still more than 2/3 full, a bucket thermometer was placed in it. Otherwise another bucket of water was obtained for the temperature measurement. The temperature was read within 2-3 minutes after the thermometer was immersed in the bucket which was kept inside the oceanographic laboratory. The sampling location was amidship on the main deck only a few metres (m) above the water line. It was on the starboard side of the vessel where there is no water exhaust of any kind. The thermometer used was a mercury-in-glass laboratory type graduated at every 0.5°C intervals, and encased in a protective brass cylinder. It was similar to the type used for daily observation at the B.C. coastal light stations, and is reported to have an accuracy of ±0.15°C (Giovando and Hollister, 1974).

The salinity was determined by means of the Autolab inductive type bench salinometer, using duplicate samples. The manufacturer of this instrument claims that the salinity can be determined to an accuracy of ±0.003°/∘∘; however, the value, ±0.004°/∘∘, is apparently more likely if determinations are made aboard ship (Strickland, 1958).

b *Engine-intake Method*

The engine intake aboard the ENDEAVOUR is located 4 m below the water line. It has a diameter of approximately 20 cm. Within a metre or so inboard of the intake location is a chamber ("sea chest") of approximately 50 cm cube connected to the intake. A Weksler industrial engine-intake mercury thermometer is fitted to this sea chest. The shipbuilder claims that this is the normal type of engine-room thermometer. It was not possible to obtain the precision of the temperature measurements made with this thermometer, but it is presumed to be within ±0.3°C. The temperature data entered in the engine-room log are obtained by this thermometer.

c *Seawater Loop (Salinity)*

A pumping system aboard the ship has the capability of delivering seawater continuously from the sea chest, through a 2-cm inside-diameter pipe

of approximately 20 m length, to the oceanographic laboratory at a rate of approximately 200 ℓ per minute. (Because of the smaller pipes fitted into the laboratory, the actual volume of water flow is only a fraction of this.) From one of the two seawater faucets located in the laboratory, salinity samples were drawn and determined for salinity using the same procedure as outlined in (a). The precision of these measurements is ±0.004°/₀₀, as previously noted.

d *Thermograph/salinograph*

The intake of the thermograph/salinograph was fitted to the second seawater faucet located in the laboratory; the salinity could therefore be measured continuously. Initially, the temperature probe (platinum-resistance sensor) of the thermograph/salinograph was fitted onto the sea chest and the temperature was measured continuously in this manner. However, although the temperatures so measured were within ±0.1°C of those measured by other techniques generally, there were occasional "large errors" or fluctuations due possibly to air pockets forming at the top of the chest. As a consequence, the probe was moved to the laboratory sink, and the temperatures of seawater flowing from one of the faucets were measured. The thermograph/salinograph is a Plessey Model 6600-T, and according to the manufacturer (Plessey Co.) is capable of giving temperatues and salinities to accuracies of ±0.1°C and ±0.03°/₀₀, respectively.

e *Salinity-temperature-depth recorder (STD)*

The Guildline Model 8700 STD was used to make casts. It employs a copper-resistance probe as a temperature sensor and a conductivity cell as a conductivity sensor. (A built-in analogue circuit converts the conductivity and temperature measurements into salinity.) According to the manufacturer (Guildline Instruments), it can measure temperature and salinity to within ±0.01°C and ±0.01°/₀₀, respectively.

f *Expendable bathythermograph (XBT)*

Temperatures were also observed with Sippican XBTs. A report describing the performance of these instruments and the discussion of the data obtained on the cruise has already been published (Wood, 1976). Only brief mention of the XBT data will be made in the present paper. The manufacturer (Sippican Corporation) claims the accuracy of the measurements to be ±0.2°C.

g *Hydrographic stations*

Only a few hydrographic stations were taken during the cruise; therefore, only brief comments will be made upon the data obtained.

3. Analysis of Data

a *Sea-surface temperature comparisons*

(i) Bucket and STD

A comparison of the sea-surface temperatures obtained simultaneously by the STD and by a pair of reversing thermometers during this cruise, as well as of similar data obtained during a weathership cruise in February-March 1975 (de Jong, 1976), indicated that the STD temperatures were generally within ±0.02°C of those measured by reversing thermometers. Therefore the STD temperatures are considered sufficiently accurate to represent the true temperatures. Accordingly, all subsequent comparisons of temperatures will consider the STD values to be the reference temperatures.

The average difference ($\overline{\Delta T}$) for all 80 near simultaneous pairs of bucket and STD temperatures obtained on this cruise was found to be 0.08°C, - with a standard deviation of ±0.19°C. As is shown in Fig. 1, the differences are approximately normally distributed about 0.1°C except for a minor peak in frequency at +0.4°C.

The relatively-frequent occurrence of differences of +0.4°C is almost certainly attributable to the improper functioning of the bucket thermometer. It was occasionally noted during the cruise that the foam-rubber sleeve placed around the thermometer to protect it from mechanical shocks had slipped down to the lower end of the thermometer and at least partially covered the main bulb. When this occurred, the bucket temperatures were noticeably higher than those obtained by the STD. Since the bucket thermometer was kept in the laboratory before use, and immersed in the bucket for only three minutes before a reading was made, it is likely that within this time, the bulb, being insulated by the foam rubber, did not attain temperature equilibrium with the water sample. Hence, in all probability bucket temperatures in such cases were overestimates. When the ten differences greater than +0.4°C were removed and the remaining values (n = 70) reanalyzed, the resulting mean difference was +0.04°C, which is only one half the value determined by consideration of all 80 pairs. The standard deviation, on the other hand, decreased only slightly, from ±0.19 to ±0.15°C.

In order to evaluate the relationship between the quality of the bucket temperatures and the individual observers, the preceding set of data was grouped according to the three "sea watches" maintained on the cruise. Each "watch" consisted of two observers and worked on the "4-hours on" and "8-hours off" schedule [(a) 08:00-12:00, 20:00-24:00; (b) 04:00-08:00, 16:00-20:00; (c) 00:00-04:00, 12:00-16:00)]. Three sets of observations are shown in Fig. 2. All three watches observed bucket temperatures that were, on the average, approximately 0.1°C higher than the corresponding STD temperatures. The data set from the three watches exhibited a bi-modal distribution, a principal peak occurring at the difference +0.1°C, and another, less pronounced peak at approximately +0.4°C. The standard deviations associated with the above three sets of data were all near +0.2°C.

(ii) Thermograph/salinograph and STD

The sea-surface temperatures obtained with the thermograph/salinograph were, on the average, 0.6°C larger than those simultaneously observed with the STD, with a standard deviation of less than ±0.1°C as shown in Fig. 3 (n = 71). The peakedness of the distribution was much more pronounced for the differences between thermograph/salinograph and STD temperatures than that previously shown for bucket temperatures (Fig. 1). This fact suggests that the thermograph/salinograph can measure sea-surface temperatures with less variation than is obtained by the bucket method, provided that suitable "corrections" are made. This could be accomplished, for the present instrument, by applying the 0.6°C difference as a field calibration (i.e. True temp. = T/S - 0.6°C).

(iii) XBT and STD

The XBT-measured surface temperatures were always higher than those obtained with the STD (Fig. 4). The average difference, for n = 64, was +0.3°C with a standard deviation of ±0.1°C. The distribution was more peaked than that associated with the bucket temperatures, but less peaked than that associated with the thermograph/salinograph temperatures. The standard deviation of bucket temperatures was ±0.19°C and of XBT temperatures was ±0.14°C; thus, the variability of the XBT temperatures is 30% less than that of the bucket temperatures.

(iv) Engine-intake and STD

During the cruise the engine-room crew made hourly observations of sea temperatures by means of a thermometer fitted into the sea chest, as described earlier. These hourly values of the engine-intake temperatures so obtained were compared with the STD temperatures taken within ±1/2 hour. In Fig. 5 is shown the frequency distribution of differences between the intake and STD temperatures (n = 80). The main feature of the distribution is that while the average difference was only 0.3°C, a figure near to that associated with the XBT data - the standard deviation was about ±1.2°C, which is an order of magnitude greater than those characterizing differences obtained with other techniques (Fig. 1, 3 and 4). Differences as large as ±2.5°C were evident.

(v) Engine intake and bucket

A comparison between the engine-intake and bucket temperatures (n = 108) indicated that, the intake temperature was, on the average, 0.3°C higher than the corresponding bucket temperature, with the standard deviation being ±1.0°C (Fig. 6). Differences of up to ±2.5°C were present in this case also.

b *Sea-surface salinities comparisons*

(i) Bucket and Seawater loop

Based on 86 pairs of salinities obtained by bucket and seawater-loop (n = 86), the average difference ($\overline{\Delta S}$) between the values observed by the two methods was only 0.003°/₀₀; the associated standard deviation was

±0.019°/₀₀. As is shown in Fig. 7, the majority of the differences lies within ±0.004°/₀₀. A maximum difference of 0.131°/₀₀ was associated with an observation made a few kilometres from the shore where low-salinity coastal water is usually present. When this difference was eliminated from the analysis, the resulting average difference and standard deviation were calculated to be 0.002°/₀₀ and ±0.013°/₀₀, respectively, a decrease of about 30% in both quantities. The differences associated with two thirds of the data pairs were within 0.008°/₀₀.

The quality of the salinity data might be subject to variation due to "sampling habits" of the various observers. In order to determine if such variation was significant the data taken by each of the three sea watches (as mentioned earlier) were grouped and the statistics for each group estimated. In Fig. 8 are shown the distributions of the differences between the bucket and seawater-loop salinities for each watch. While the average difference between the salinities observed by the two methods for each watch was small, ranging by only 0.004°/₀₀, the standard deviations associated with the data of each watch were different. The standard deviations associated with watches (a) and (b) were similar, ±0.008°/₀₀ and ±0.009°/₀₀, respectively; however, watch (c) yielded a deviation more than twice as great (±0.019°/₀₀) as those of the other watches. For watches (a), (b) and (c), the percentage of data whose differences were less than 0.008°/₀₀ was 89%, 72% abd 43%, respectively. Clearly watch (c) did not make careful observations as did the other two watches [(a) and (b)].

(ii) STD and seawater loop

The differences between the surface salinities obtained by the STD and by the seawater loop (salinity determined by laboratory salinometer) generally varied from 0 to 0.10°/₀₀ -- the average being 0.04°/₀₀ (n = 80), as shown in Fig. 9. The associated standard deviation was ±0.03°/₀₀. When one difference suspected of possessing an unusually large error was deleted and the statistics re-estimated, the resulting mean and standard deviations were, respectively, 0.04°/₀₀ and ±0.02°/₀₀. Thus while the elimination of one large value did not affect the mean, it decreased the standard deviation by about one third. This offset (average difference) of 0.04°/₀₀ is probably attributable to the inherent problem of the electronic circuitry of the STD's deck unit to properly convert a temperature and a corresponding conductivity value to salinity. Thus, while the sea temperatures measured with this STD yielded values close to the presumed true temperatures as measured by reversing thermometers (page 4), the measured salinities at the surface appear to be 0.04°/₀₀ too high. A similar situation had been noted on a previous cruise (de Jong, 1976).

(iii) Thermograph/salinograph and Seawater loop

The salinities measured with the thermograph/salinograph are those of the seawater that is pumped from the engine intake via the seawater loop. Thus the seawater-loop salinities, as determined by the laboratory salinometer, can be compared directly with those obtained with the thermograph/salinograph. It was found that the average difference between the thermograph/salinograph and seawater loop salinities was 0.11°/₀₀, with a standard deviation of

±0.02°/₀₀ (n = 108). When thermograph/salinograph values were "corrected" by subtracting this "field calibration" value of 0.11°/₀₀, it was indicated that the instrument was then capable of measuring salinity with a standard deviation of ±0.02°/₀₀ as shown in Fig. 10. With the exception of one value (±0.13°/₀₀) suspected of containing an unspecified error, the differences were found never to exceed ±0.05°/₀₀.

c *Representative data obtained during the cruise*

In Figs. 11 and 12 are shown the representative temperatures and salinities respectively, observed by the various methods along one leg of the cruise, Line P - between Victoria, B.C. (home port) and Ocean Station P (50°N., 145°W.). In each case the values given by the thermograph/salinograph have been "corrected" by subtracting 0.6°C and 0.11°/₀₀ from each of the observed temperatures and salinities, respectively. Figs. 11 and 12 demonstrate that the thermograph/salinograph, once properly calibrated, gives consistent values - and, because of its ability to monitor data continuously, can be a useful tool for examining details in the distribution of the surface-water properties.

4. Discussion

a *Temperature*

Under the assumption that the sea-surface temperatures observed with the STD represent the true surface temperatures, comparison of these data with those obtained by a simple bucket thermometer revealed that the bucket method is capable of providing temperatures with a standard deviation of ±0.15°C. This value is comparable to the standard deviation of the bucket thermometer and therefore indicates that the surface temperatures obtained with this instrument are about as good as they can be. The value is also similar in magnitude to that obtainable by the use of specially-designed bucket thermometers used by the Canadian weatherships at Ocean Station P (Tabata, 1977b). Thus the simple bucket thermometer used on this cruise is capable of measuring sea-surface temperatures as reliably as the more expensive, specialized equipment.

The temperatures obtained with the thermograph/salinograph are those of the water flowing from the laboratory faucets; this water has entered the ship's engine intake located approximately, at a distance of 20 m via pipe away in the case of ENDEAVOUR. These temperatures were almost always larger than those simultaneously recorded by the STD, the average difference being 0.6°C. When measured at the engine intake itself, the observed temperatures were close to the true (STD) temperatures; therefore, the difference is almost certainly due to the warming of the water by the heat inside the ship during the water's passage from the intake to the laboratory. However, when the thermograph/salinograph-measured temperatures were field calibrated by subtracting 0.6°C from all the observed temperatures and the results compared with the STD values, the standard deviation of the differences was only ±0.07°C, which is half as large as the corresponding value based on bucket observations. This indicates that the

thermograph/salinograph is capable of yielding temperatures that are even more reliable than those obtained by the bucket, provided that suitable calibrations can be performed and applied. It must be emphasized however, that this is a function of ship and ship pipe-routing, and that if modifications to piping is made, recalibration is necessary. Also it will depend on the pumping rate.

The XBT gave temperatures that were, on the average, 0.27°C larger than those of the STD, with a standard deviation of ±0.14°C. Thus, while there appears to be a positive offset in the XBT data, the standard deviation is about the same as that associated with the bucket observations. The XBT is therefore capable of measuring surface temperatures to the same accuracy as can the bucket thermometers, if the offset of 0.27°C can be removed. But under operational conditions at sea, it is difficult to know whether such an offset is present in every XBT unless each instrument is tested before being released, a practice that is recommended. (The magnitude of this offset should <u>not</u> be taken as representative of XBTs used elsewhere. It has been the experience of the Canadian weathership oceanographic program that in the past some batches of XBTs had given surface temperatures that were as much as 1°C lower than the true temperatures.) The average shift of 0.27°C is 0.11°C larger than Wood (1976) has estimated utilizing the same XBT records from the cruise. This difference probably is due to the manner in which the temperatures were obtained from the records; the present study is based on an analysis of temperatures obtained <u>directly</u> from the original traces on the charts, while Wood (1976) utilized data <u>digitized</u> from the original traces and then smoothed before analysis. Wood (*ibid.*) noted that digitizing technique alone can give errors of ±0.14°C, thus the difference between the two biases is not unexpected.

Perhaps the most significant and pertinent result of the present investigation is concerned with the quality of the engine-intake temperatures as taken by the ship's crew. Such data are the mainstay of present-day merchant-ship sea-surface temperature reports. Although the intake temperatures were on the average only 0.3°C larger than the STD temperatures, the standard deviation of the differences was ±1.2°C, which demonstrates that the intake temperatures, as recorded, are appreciably inaccurate. No doubt part of the inaccuracy may be attributable to the fact that the instrument is graduated in 0.5°C intervals; however this characteristic is unlikely to account for the large differences that were observed. The differences in time between the STD observations and the recording of the intake temperatures apparently did not contribute much to the errors either since large errors were present even when the difference was only a few minutes. If the intake temperatures were consistently higher, one might argue that they had been influenced by heat from the engine room; in the same regard the suitability of the thermometer location could be questioned. However, the intake temperatures were noted to <u>underestimate</u> the true temperatures a significant number of times; therefore, the differences could not all have been due to engine-room heat, although the exact location of the thermometer might have influenced the measurements somewhat because of heat conduction along the pipe fittings. Since the intake thermometer was fitted to the sea chest, it is possible that an error could have resulted from the parallax of the reading because it was located much below the eye level. Brooks (1926) has stated that aboard one merchant ship whose data he studied this fact

could have resulted in errors of 0.5°C. However, even this value is smaller than the suspected errors noted for this cruise. The only remaining source of error would be associated with the reading of the thermometer; and it is suspected that this might have contributed to the appreciable inaccuracy associated with these data. The overestimate of intake temperatures by an average amount of 0.3°C is indeed an interesting result. Except for the results of Roll (1961), Knudsen (1966) and Saur (1963), others including Brooks (1926), Walden (1966), James and Fox (1972) and Collins *et al* (1975) all have arrived at this 0.3°C. However, while it indicates that the intake temperatures are in general somewhat higher than the bucket temperatures, this average difference is probably not as important as is the large standard deviation associated with it.

b *Salinities*

An examination of the differences between the bucket and the seawater-loop salinities showed that the surface salinities were, on the average, 0.002 ± 0.013°/₀₀ higher than the 4-m salinities. However, the difference is not statistically significant at the 95% probability level, and therefore the salinity obtained from either the bucket or the seawater loop is acceptable as a surface value. In another study (Tabata, 1977b) based on samples obtained with Nansen or Niskin deep-sea sampling bottles at Station P, it was found that within the surface mixed layer the water was isohaline all year to within ±0.004°/₀₀. Thus the above standard deviation of ±0.013°/₀₀ is significantly larger than would be expected. With this proviso, it is evident therefore that some errors are present in the observations.

According to Strickland (1958), the salinities of two samples of seawater cannot be considered to be significantly different, at the 95% probability level, unless the values differ by more than 0.008°/₀₀ - for the case when salinities are determined by laboratory salinometers at sea. Sixty-eight percent of the differences between the bucket and seawater loop salinities were within 0.008°/₀₀. For the three sea watches (a), (b) and (c) the percentages of differences falling within 0.008°/₀₀ were 89, 72 and 43%, respectively. The standard deviations of the differences for the three watches were ±0.008°/₀₀, ±0.009°/₀₀ and ±0.019°/₀₀, respectively. Therefore it appears that of the three watches the third (c) made observations that were, on the whole, much more inaccurate than the other two. Incidentally, it was the same watch (c) which made temperature observations that were somewhat less accurate than those made by the others (Fig. 2c). Thus it seems that the sampling techniques or habits of individuals can introduce unnecessary errors into the observations. Since the salinity samples are collected from the seawater loop with relative ease - all that is required is to fill the 300-ml sample bottles with the seawater from the faucet after rinsing the bottles three times with the seawater, it is doubtful if large sampling errors can be attributed to the salinities determined from the seawater loop. On the other hand, the bucket observations are made from the main deck (located about 2 m above the water line) on the starboard side of the ship, under a variety of weather conditions. It is possible that the exact technique used to collect the bucket samples may vary with an individual, despite the same sampling instructions being given to all observers; it is also quite probable therefore that the larger deviation in the data obtained by the third watch (c) is attributable to observer error.

The salinities observed with the thermograph/salinograph were larger on the average, by 0.11°/₀₀ than those observed by the other methods. These latter values, since they are determined with reference to standard Copenhagen seawater, are considered to represent the true salinities. This offset ("systematic error") is likely to be the result of improper calibration since, when each of the observed data were "corrected" by applying the value of -0.11°/₀₀ the salinities so obtained were within ±0.02°/₀₀ of those measured by the other methods. Similar results have been obtained for the data collected from the weatherships (Tabata, 1977b).

This study shows that even the simple bucket technique can provide sea-surface temperatures and salinities to an accuracy of ±0.1°C and ±0.01°/₀₀, respectively, provided the observations are made with reasonable care. The series of observations discussed here were made from a research ship of approximately 2000 tons; however, the height from which the observations were made was only 2 m from the water line. Although the accuracies noted above should be attainable from other vessels of similar configuration they are unlikely to be achieved for measurements made from larger (e.g. merchant) vessels for at least two reasons. Firstly, the bridge level of these ships, from which the bucket must be used, may be 10 m or more above the water line. Secondly, observations must generally be made while the ship is cruising at 15 knots or more. The proper collection of bucket samples from such heights at such speeds, especially during windy days, is a difficult task. The bucket temperatures have been reported to under-read, especially if the air temperature is lower than the sea temperature (Brooks, 1926; Tauber, 1969). Hitherto, even when the temperatures were measured by well-trained oceanographic observers there appear to be excessive errors present in the data.

c *Comparison with data collected from other cruises*

In the light of the results obtained in this study and in the recent analysis of the Station P data (Tabata, 1977b), some comments upon the quality of the data collected from previous oceanographic cruises in the northeast Pacific Ocean can be made. During the NORPAC Project of 1955 (NORPAC Committee, 1960), both the Pacific Oceanographic Group (POG) of the Fisheries Research Board of Canada and the Department of Oceanography of the University of Washington (UW) surveyed the same general area. The former obtained the surface salinity samples with a canvas bucket while the latter observed them with a Nansen deep-sea sampling bottle. Both observed 10-m salinities with the Nansen sampling bottle. The differences between the surface and 10-m salinities for the two sets of data reflect the possible influence of sampling techniques upon the quality of the surface data. In the POG data 80% of the differences showed surface salinities to be greater than the corresponding values at the 10-m depth; for the UW data, only 14% of the surface salinities were greater than the 10-m values. The average differences and the standard deviations for the two sets of data were, respectively, 0.03 ± 0.04°/₀₀ (n = 83) and -0.02 ± 0.04°/₀₀ (n = 68). (Actually, there was a total of 72 salinity observations, but four of these indicated the presence of an appreciable vertical salinity gradient in the surface layers and therefore not considered.) The difference between the two averages were statistically significant at the 99% probability level.

A comparison in some detail of surface data gathered over a considerable period is of interest. It is, here considered necessary to treat only those observations made during relatively windy days (with wind speed greater than say, approximately 6 m/s), because at such time the surface mixed layer is considered to be isothermal and isohaline to a depth of 10 m (Tabata *et al*, 1965). In Table 1 are shown the cruise means and standard deviations under these conditions for the differences between the surface and 10-m temperatures and salinities - based on data obtained by: 12 major oceanographic surveys conducted in the northeast Pacific Ocean during 1955-1962, at Station "P" during 1956-1976 and by ENDEAVOUR during 1975.

From Table 1, it is evident that, on the average, the temperature differences and standard deviations obtained from the data of the 12 surveys, are comparable in magnitude to those from earlier Station P (1956-1968) and from the recent ENDEAVOUR observations. In all but one case, the surface temperatures are overestimated. The more recent (1969-1976) Station P data are noteworthy for having standard deviations that are much lower than those of the other years. No doubt part of this condition can be attributed to the instrument and technique that were used to obtain these later Station P data. The average difference (much greater than 0.1°C) and standard deviation (much greater than ±0.1°C) noted for the other data appear to be excessive and are, by the same token, likely to be associated with poorer techniques used to obtain the surface temperatures. For the ENDEAVOUR data at least, removal of data with excessively large errors decreased the mean difference and the standard deviation somewhat, though not significantly at the 95% probability level.

For salinity on the other hand, the differences and standard deviations based on the 12 cruises, are, on the average, greater by an order of magnitude than the later Station P or the ENDEAVOUR values, though comparable to those based on the earlier Station P data. The implication is that the surface salinity data of the 12 cruises and of the earlier Station P are inferior in quality to the later Station P and the ENDEAVOUR data. It has already been mentioned that the relatively-poor quality of the earlier surface data from Station P data can be related to inferior techniques (Tabata, 1977b). Similarly, the relatively-large standard deviation present in the data from the 12 cruises can also be attributed to poor techniques; that is, to improper observations of the surface temperatures and to inadequate rinsing of the buckets used in collecting surface salinity samples.

Of the three winter cruises, only one indicated that the surface temperatures might have been underestimated. It may be noted that the practice of underestimating winter surface temperatures is not difficult to understand. In the northeast Pacific the air temperature is lower than the sea temperature, during October through March (Tabata, 1964). Under such conditions heat loss from the sample is likely unless temperatures are read within a minute or so after collection. Brooks (1926) found that when bucket temperatures were obtained from samples collected from the bridge level they were about 0.3°C lower than those collected from lesser heights. When the crew (from the ship Brooks was aboard) collected the sample from the

bridge level, the temperatures were lower than the true temperatures by twice (0.6°C) as much as he obtained. Further, Tauber (1969) has noted that the temperature of a surface bucket sample could cool by 0.2°C in 3 minutes after the sample has been collected. Thus, sea-surface temperatures taken during the above three winter cruises could have been influenced by such cooling.

However, most of the surface temperatures were overestimated, even during the winter. This action is understandable in summer, at which time the air temperature generally is greater than the sea temperature (Tabata, 1964). It is therefore possible that the bucket samples could have been heated, especially if observations had been made during sunny weather. But overestimation of the winter surface temperatures in winter demands some other explanation. Some possible reasons are: the thermometer calibration was incorrect; the protective cylinder housing the thermometer could be improperly designed (such as was the case for the ENDEAVOUR); the bucket sample could have been warmed by the deck of the ship, or by the atmosphere. It is suspected that the overestimates may have resulted from a combination of the above reasons and also perhaps from the inability of the observers to read the thermometers within the prescribed time (the thermometers being left in the bucket on the deck too long before being read). Also, the surface observations were perhaps not taken with sufficient care because the importance of the accuracy of surface observations was seldom, or imperfectly communicated to the observers.

5. Summary and Conclusions

Although bucket observations are considered to be too crude by some, they are nevertheless capable of providing sea-surface temperatures with an accuracy commensurate with the limitation of the thermometer used. The sea-surface temperatures observed with the thermograph/salinograph by measuring the temperatures of the water entering the ship at the engine intake and flowing out of the laboratory faucet were found, after correction for the effect of heating within the ship, to represent sea temperatures with standard deviation which was about one half as large as that of the bucket observations. Thus such instruments provided that they are "field-calibrated" regularly, should be able to provide reliable data. The sea-surface temperatures observed with the batch of XBTs available for the ENDEAVOUR cruise were, on the average, 0.3°C larger than the actual temperatures. If an appropriate correction was made for this difference, the XBT yielded temperatures with an accuracy comparable to that from bucket observations. The reliability of the temperatures given by the XBT would be improved if a method could be devised to test each probe before its deployment.

The engine-intake temperatures were, on the average, 0.3°C larger than the actual temperatures, but the data were characterized by the presence of much large standard deviation (±1.2°C). The scatter is an order of magnitude greater than that present in the data obtained by other methods. Such large scatter appear to be common in merchant-ship observations everywhere. In the present case (ENDEAVOUR cruise) the scatter is believed to be due to reading errors rather than to the location of the engine-room thermometer. If so, the errors can certainly be reduced by the use of a digital readout.

Sea-surface salinities based on bucket observations were found to represent surface salinities quite well. No statistically significant difference existed (at the 95% probability level) between the surface salinities from bucket and those from the engine-intake (depth of 4 m).

Errors in the determination of the surface salinities could be caused by the observing habits associated with the individual sea watches. While the first and the second watches both obtained surface and 4-m salinities within the limits of the salinity determination in 90% and 70% of the cases, respectively, the third watch, in contrast, obtained such salinities only about one half as frequently. Although the standard deviations associated with the differences between the surface and 4-m salinities of the third watch was significantly higher (at the 95% level) than those of the other two watches, the standard deviations of the corresponding temperature differences, though higher also, was not significantly different. The larger salinity error associated with the one watch is attributed to the inadequate rinsing of the bucket before salinity samples are collected. This is an example of how a seemingly-unimportant facet of the procedure can affect the data. Unless an accuracy in salinity of only $\pm 0.1\,^{\circ}/_{\circ\circ}$ can be tolerated, attempts should be made to obtain the salinity samples properly. The salinities observed with the thermograph/salinograph were, on the average, $0.11\,^{\circ}/_{\circ\circ}$ larger than the actual salinities. If the instrument is field-calibrated by applying this value, it is capable of providing sea-surface salinities to an accuracy of $\pm 0.02\,^{\circ}/_{\circ\circ}$.

In the light of the conclusions drawn from recent data, it appears that the sea-surface temperatures and salinities observed in the northeast Pacific Ocean during 1955 through 1962 appear generally to have been overestimated. It has proven difficult to trace the sources or the contributions of the various possible errors to the inaccuracies in the temperature determinations. Inaccuracies in salinity are believed to be due primarily to improper procurement of bucket samples.

Acknowledgements

Grateful acknowledgement is made to Dr. J.F. Garrett, senior scientist, and to the oceanographic observers aboard the C.F.A.V. ENDEAVOUR who assisted in the collection of the data; to Chief Engineer, Mr. L. Carr and his engine-room crew for preparing and providing the engine-intake temperature data; C. de Jong, M. MacNeill, F.A. Hartley and P. Kimber for their assistance in the analysis of the data; and P. Kimber who prepared all the original illustrations. I further wish to thank Drs. J.F. Garrett and L.F. Giovando for their kind and constructive comments and criticisms.

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Table 1. Cruise means and standard deviations of the differences between the surface and 10-m temperatures (°C) and salinities (‰)-based on observations made when wind speeds exceeded 6.2 m/s, in the northeast Pacific Ocean during 1955-1962, at Station P during 1956-1976, and off Pacific coast of Canada in 1975. Pertinent information associated with the cruises are also included. The data from the 12 cruises involved have been obtained from a number of manuscript reports published by the Fisheries Research Board of Canada, e.g. Dodimead *et al*, 1962.

Date	Name of Ship	T_0-T_{10}		Number of Observations (n)	S_0-S_{10}		Number of Observations (n)	Instrument used to collect surface samples	Remarks
		Mean	Standard Deviation		Mean	Standard Deviation			
1) Summer 1955	H.M.C.S. STE. THERESE			40	+0.030	0.034	40	Canvas bucket	No surface temperature data except from bathythermograph. Salinities determined to 2 places of decimal.
2) Summer 1956	H.M.C.S. NEW GLASGOW	+0.18	0.29	28	+0.063	0.059	28	Canvas bucket	Surface temperatures read to one place of decimal; salinities determined to 2 places of decimal.
3) Winter 1957	H.M.C.S. OSHAWA	+0.16	0.35	26	+0.024	0.067	26	Canvas bucket	Same comments as (2).
4) Summer 1957	H.M.C.S. OSHAWA	+0.27	0.14	4	+0.058	0.019	4	Canvas bucket	Same comments as (2). There were only 4 cases when wind speed was greater than 6.2 m/s.
5) Spring 1958	H.M.C.S. OSHAWA	-	-	-	-	-	-	-	No surface samples taken.
6) Summer 1958	H.M.C.S. OSHAWA	-0.07	0.17	25	+0.007	0.026	27	Galvanized tin bucket	Same comments as (2).
	C.N.A.V. WHITETHROAT	+0.17	0.19	40	+0.013	0.081	39	Galvanized tin bucket	Same comments as (2).
7) Winter 1959	C.N.A.V. OSHAWA	+0.08	0.28	42	+0.013	0.032	43	Polyethylene bucket	Temperatures read to one place of decimal; salinities determined to 3 places of decimal.

...Continued

Table 1. (Continued)

Date	Name of Ship	T_0-T_{10}		Number of Observations (n)	S_0-S_{10}		Number of Observations (n)	Instrument used to collect surface samples	Remarks
		Mean	Standard Deviation		Mean	Standard Deviation			
8) Summer 1959	C.N.A.V. OSHAWA	0	0.31	34	+0.017	0.019	35	Galvanized tin bucket	Same comments as for (7).
	C.N.A.V. WHITETHROAT	+0.07	0.20	13	+0.059	0.033	14	Galvanized tin bucket	"
9) Winter 1960	H.M.C.S. BEACON HILL	-0.23	0.32	39	+0.023	0.020	39	Polyethylene bucket	"
10) Summer 1960	C.N.A.V. OSHAWA	0	0.20	52	+0.005	0.005	52	Thermoplastic bucket	"
	C.N.A.V. WHITETHROAT	+0.03	0.04	6	+0.007	0.008	5	Thermoplastic bucket	"
11) Spring 1961	C.N.A.V. OSHAWA	+0.20	0.24	29	+0.016	0.014	28	Bucket (type unspecified)	"
	C.N.A.V. ST. ANTHONY	+0.03	0.10	34	+0.022	0.034	34	Bucket (type unspecified)	"
12) Spring 1962	C.N.A.V. OSHAWA	+0.08	0.12	47	+0.044	0.029	47	Galvanized tin bucket	"
	C.N.A.V. WHITETHROAT	+0.10	0.17	26	+0.030	0.056	26	Galvanized tin bucket	"
Total							487		
Weighted Mean		+0.05	0.22		+0.024	0.040			

...Continued

Table 1. (Continued)

Date	Name of Ship	T_0-T_{10}		Number of Observations (n)	S_0-S_{10}		Number of Observations (n)	Instrument used to collect surface samples	Remarks
		Mean	Standard Deviation		Mean	Standard Deviation			
1956-1969	Station P	+0.06	0.26	273	+0.021	0.047	372	Canvas, galvanized tin, thermoplastic, and rubber buckets	Surface temperature read to one place of decimal; salinities determined to 2 places of decimal during 1956-1958 but to 3 places subsequently.
1969-1976	Station P	+0.02	0.04	185	+0.002	0.013	184	Nansen or Niskin sampling bottles	Surface temperatures read to 2 places of decimal; salinities determined to 3 places of decimal.
Summer 1975	C.F.A.V. ENDEAVOUR	+0.08	0.19	80	+0.003	0.019	86	Rubber bucket	Surface temperature read to one place of decimal; salinities determined to 3 places of decimal. Observations were not available for the 10-m depth; data from 4-m depth were substituted. No wind data was available.
		(+0.04	0.15	70	+0.002	0.013	85)		Data with suspected errors removed.

LIST OF FIGURES

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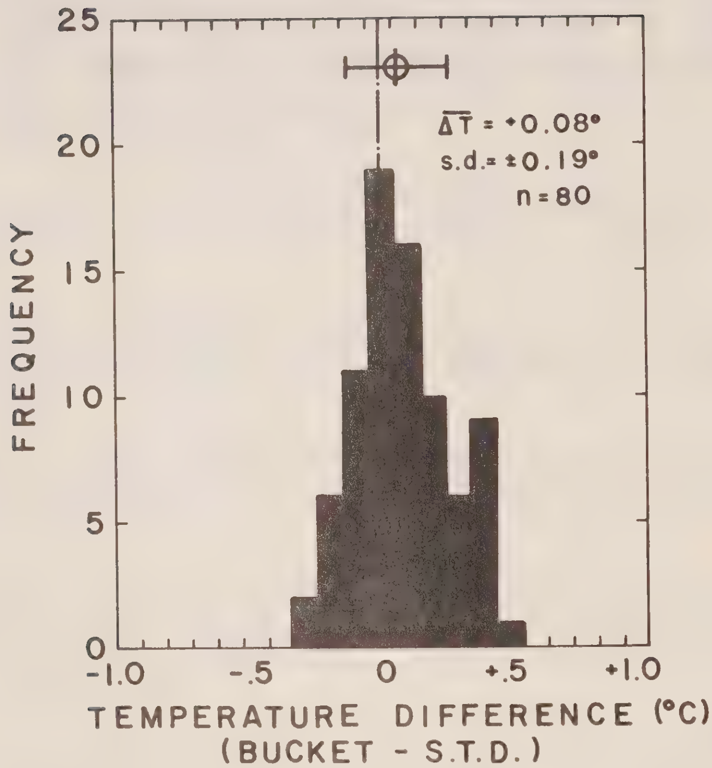

Fig. 1. Frequency distribution of differences between bucket and STD temperatures (°C). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

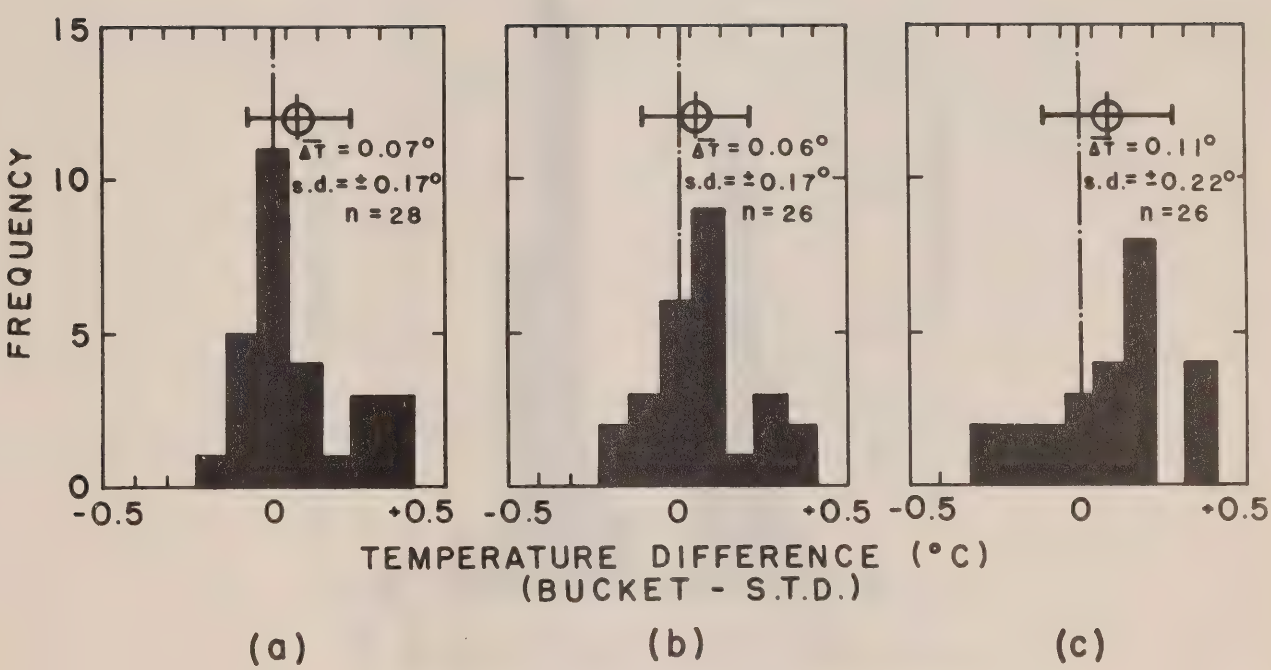

Fig. 2. Frequency distribution of differences between bucket and STD temperatures (°C) grouped according to observations by the three sea watches: (a) 8-12, (b) 4-8 and (c) 12-4. C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

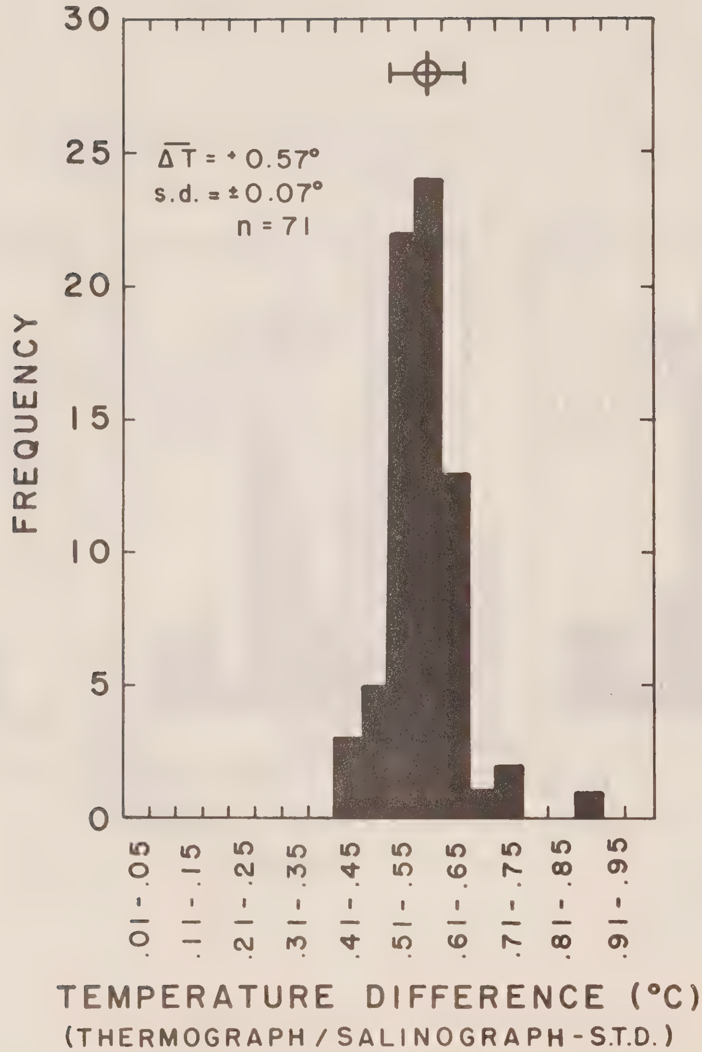

Fig. 3. Frequency distribution of differences between thermograph/salinograph and STD temperatures (°C). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

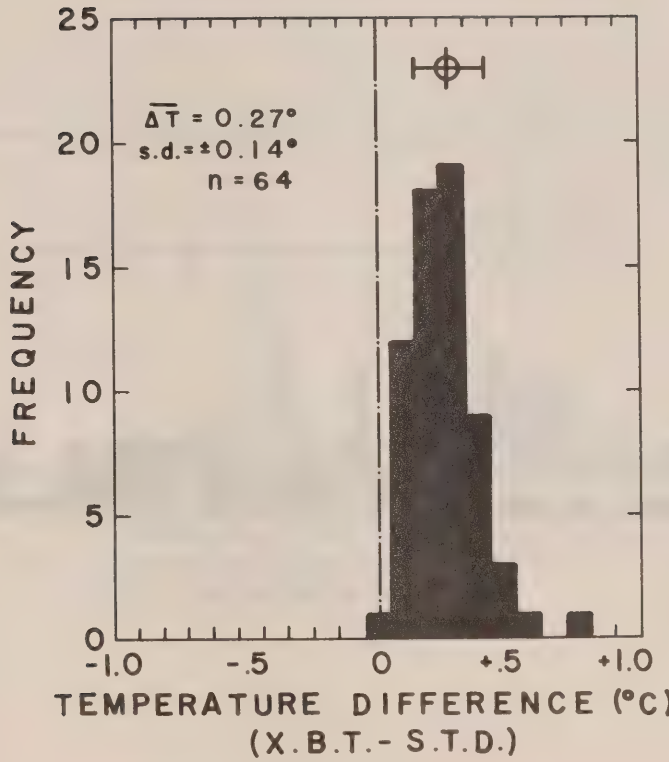

Fig. 4. Frequency distribution of differences between XBT and STD temperatures (°C). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

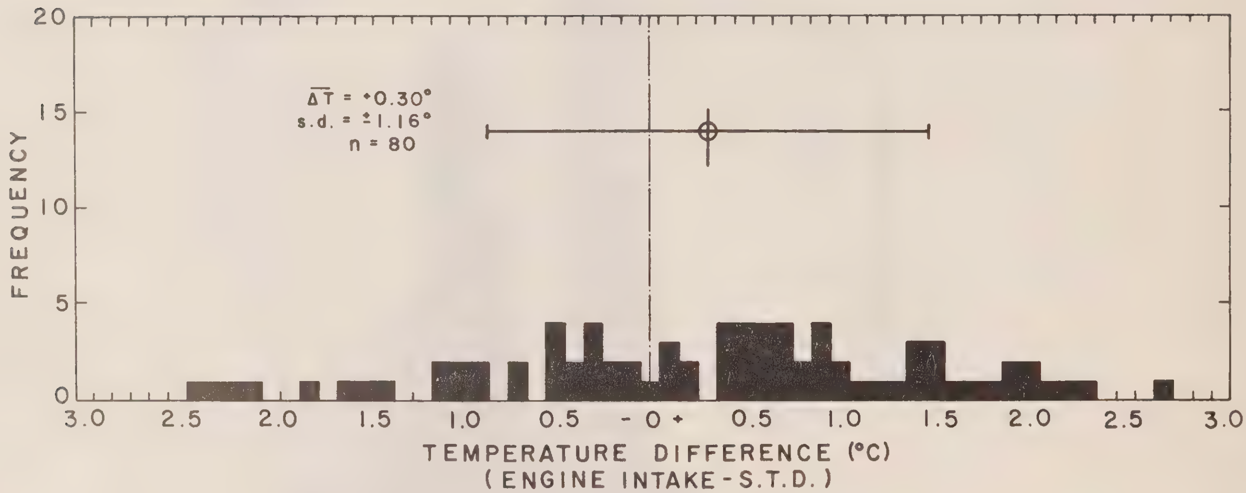

Fig. 5. Frequency distribution of differences between engine-intake and STD temperatures (°C). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

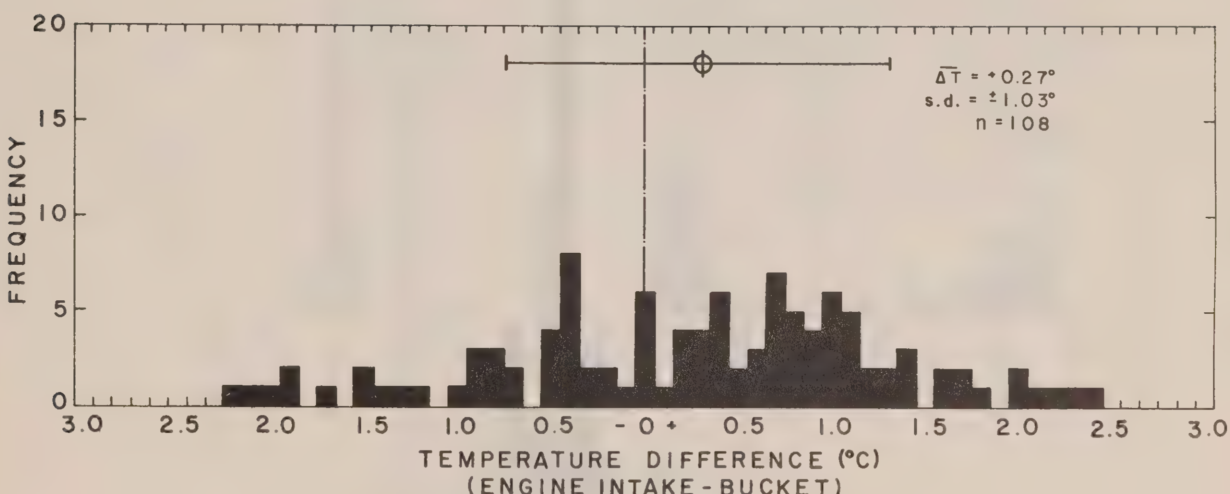

Fig. 6. Frequency distribution of differences between engine-intake and bucket temperatures (°C). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

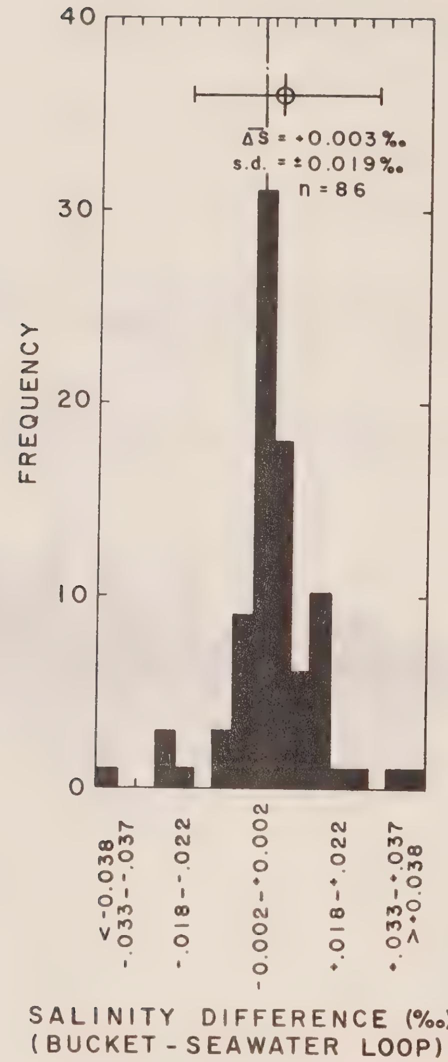

Fig. 7. Frequency distribution of differences between bucket and seawater-loop salinities (°/₀₀). The salinities were determined by means of a laboratory salinometer. C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

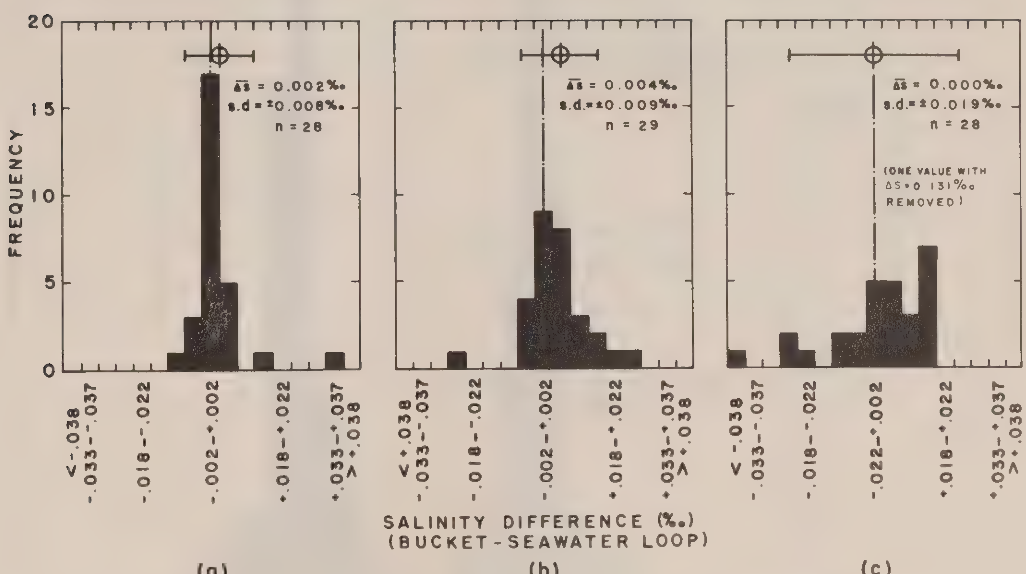

Fig. 8. Frequency distribution of differences between bucket and seawater-loop salinities (°/oo) grouped according to observations by the three sea watches: (a) 8-12, (b) 4-8 and (c) 12-4. C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

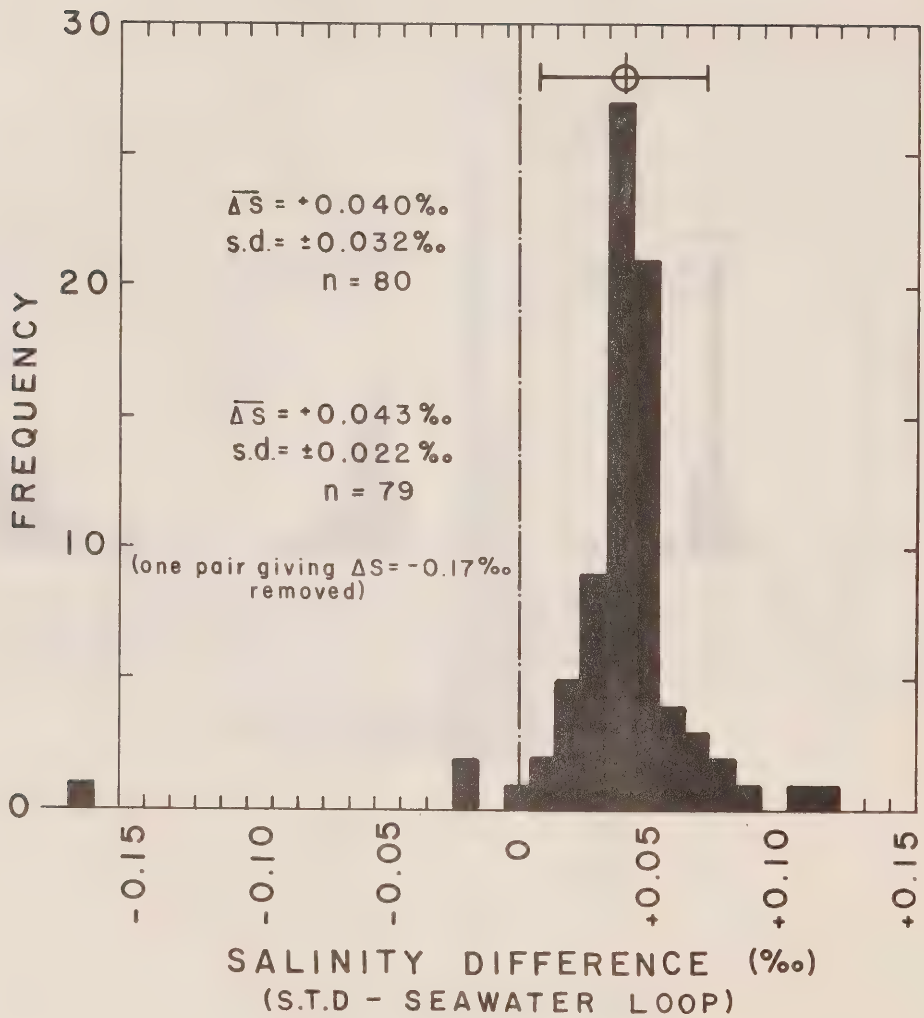

Fig. 9. Frequency distribution of differences between STD and seawater-loop STD salinities (°/₀₀). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

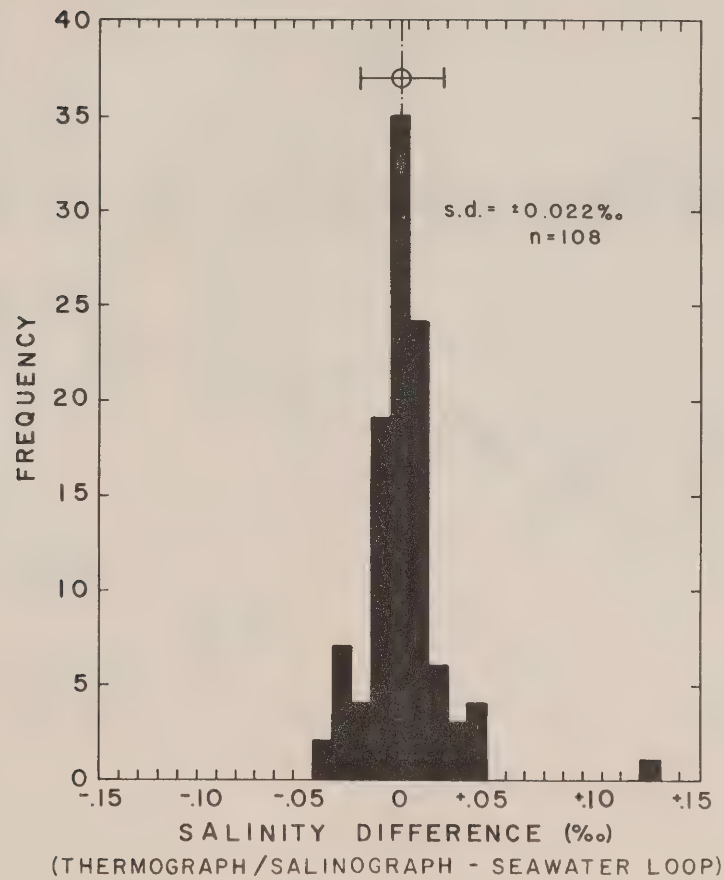

Fig. 10. Frequency distribution of differences between thermograph/salinograph and seawater-loop salinities (°/∘∘). The latter were determined by means of a laboratory salinometer. The salinities determined by means of the thermograph/salinograph have been "corrected" (see text). C.F.A.V. ENDEAVOUR, 19 August - 10 September 1975.

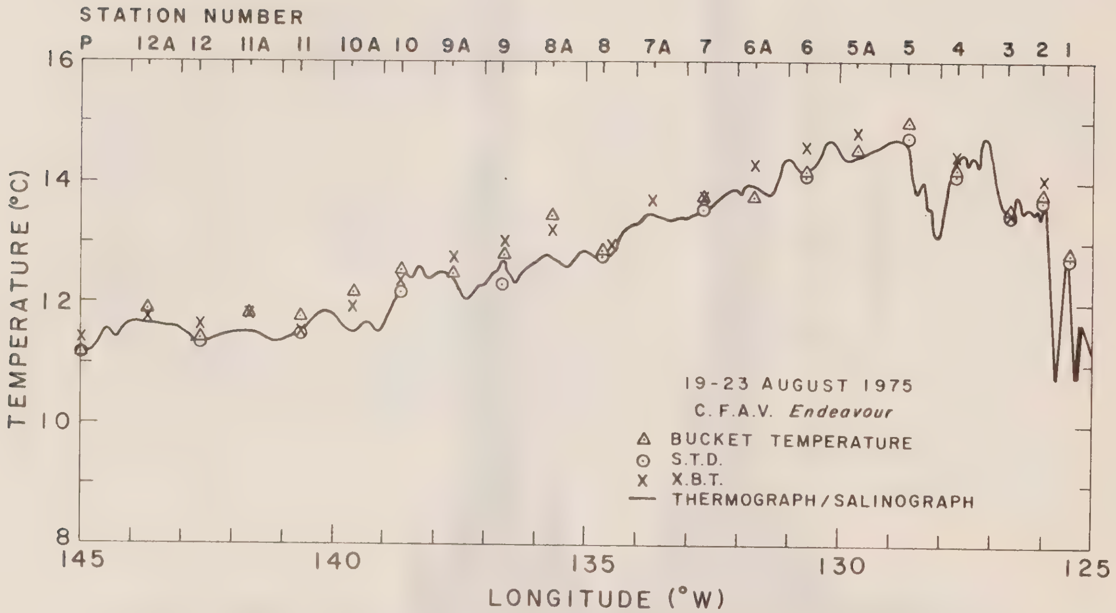

Fig. 11. An example of surface temperature (°C) obtained by various methods. The data were taken along Line "P". The temperatures determined by means of the thermograph/salinograph have been "corrected" (see text). C.F.A.V. ENDEAVOUR, 19-23 August 1975.

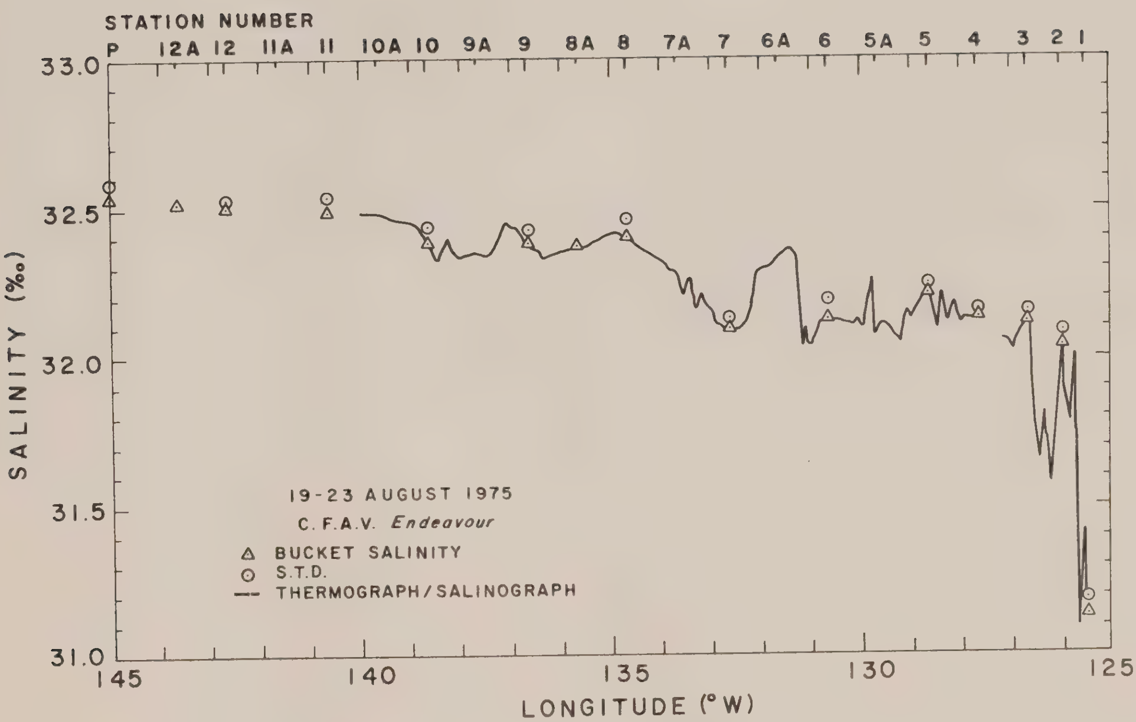

Fig. 12. An example of surface salinity (°/∘∘) observed by various methods. The data were taken along Line "P". The salinities determined by means of the thermograph/salinograph have been "corrected" (see text). C.F.A.V. ENDEAVOUR, 19-23 August 1975.

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APRIL 1973

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January 1978

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ABSTRACT

Oceanographic measurements were obtained in Barrow Strait and Wellington Channel, N.W.T., in April, 1973 through a landfast ice-cover. Repeated vertical profiles of temperature and salinity at a fixed location showed little variation in the salinity structure but showed an intermittent temperature maximum and minimum. The temperature maximum and minimum had mean temperatures of -1.45°C and -1.59°C, respectively, with departures of approximately 0.2°C from ambient values. The near-bottom currents were weak, 20 cm/s or less, and exhibited a diurnal variation in direction but less regular changes in speed. In the upper 45 m, the current-speed generally increased with depth. The maximum observed current-speed was 44 cm/s at 45 m depth. The directions of the currents varied considerably from one level to another; differences of 40° or more, over 10 m in depth, were common. No systematic rotation of the current with depth was observed.

Acknowledgments

We wish to express our thanks to A. R. Milne* and other personnel of Defence Research Establishment Pacific who made this work possible and the Canadian Forces and their personnel who manned the helicopter. We thank Mr. F.G. Barber, Dr. R.E. Thomson and Dr. E.R. Walker for their comments on the manuscript.

* Now with Institute of Ocean Sciences, Patricia Bay.

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1. Introduction

With increasing activity in the Canadian Arctic Archipelago, a knowledge of environmental factors becomes more desirable. Towards this end an oceanographic program was carried out in Barrow Strait and Wellington Channel, N.W.T. in 1973. The program was divided into two phases: one for the measurement of water properties and ocean currents under a cover of land-fast ice in April, 1973, another for the measurement of water properties and ocean currents with little or no ice cover in August - September, 1973. In this report, the results of the first phase are presented while the results of the second phase, including seasonal comparisons between spring and summer observations, are found in a companion report (Herlinveaux et al, 1978), at present in the course of preparation.

2. Review

2.1 Bathymetry

Barrow Strait is a part of Parry Channel which connects the Beaufort Sea of the Arctic Ocean in the west to Baffin Bay in the east as shown in Figure 1. At the western end of Barrow Strait, between Bathurst Island and Prince of Wales Island, the exchange of water through Parry Channel is limited by a sill. Due to the irregular bathymetry within the sill region, the limiting sill depth remains somewhat uncertain because of incomplete surveys but is thought to be less than 130 m (see Figure 2). Barrow Strait deepens and acquires a more U-shaped vertical cross-section eastward towards Lancaster Sound.

A series of channels branches northward and southward.To the north are Wellington Channel and McDougall Sound while Prince Regent Inlet and Peel Sound adjoin the southern side of Barrow Strait. While the bathymetry in each of these adjoining water bodies is uncertain due to incomplete hydrographic surveys, the existing sparsely distributed soundings suggest that each has areas where the depths exceed those of Barrow Strait. However, for water to travel from either the Arctic Ocean or Baffin Bay into Barrow Strait through these channels, the effective sill depth in each case appears to be less than the 130 m sill depth of Barrow Strait.

Wellington Channel has a relatively deep basin with maximum recorded depths of 330 m being observed off the north end of Cornwallis Island. On the Barrow Strait end of Wellington Channel, a broad sill is found with a depth of approximately 140 m. At the north end of Wellington Channel, a shallower sill occurs but its depth is difficult to determine due to the lack of soundings. We estimate that the sill depth is probably less than 50 m although more complete surveys are needed to be certain.

2.2 Ice Cover

The seasonal pattern of ice growth and decay varies considerably both from one year to another and within different areas of Barrow Strait and Wellington Channel. Since the growth and decay of sea ice has an important influence on the heat and salt content of the ocean below, we shall examine ice climate patterns in some detail.

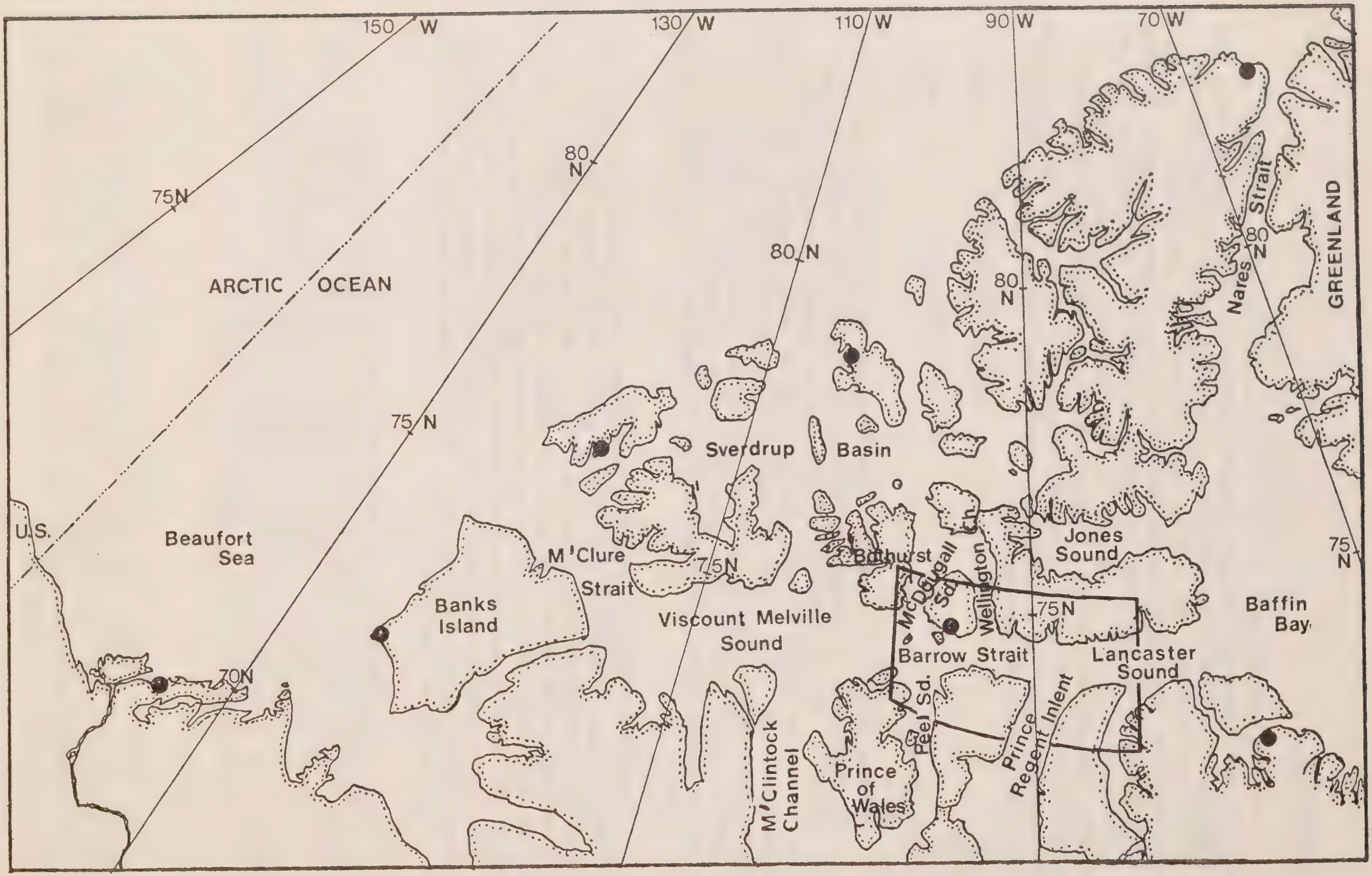


Figure 1: Map of Parry Channel in the Canadian Arctic Islands. The outlined area indicates the region in which oceanographic measurements were made.

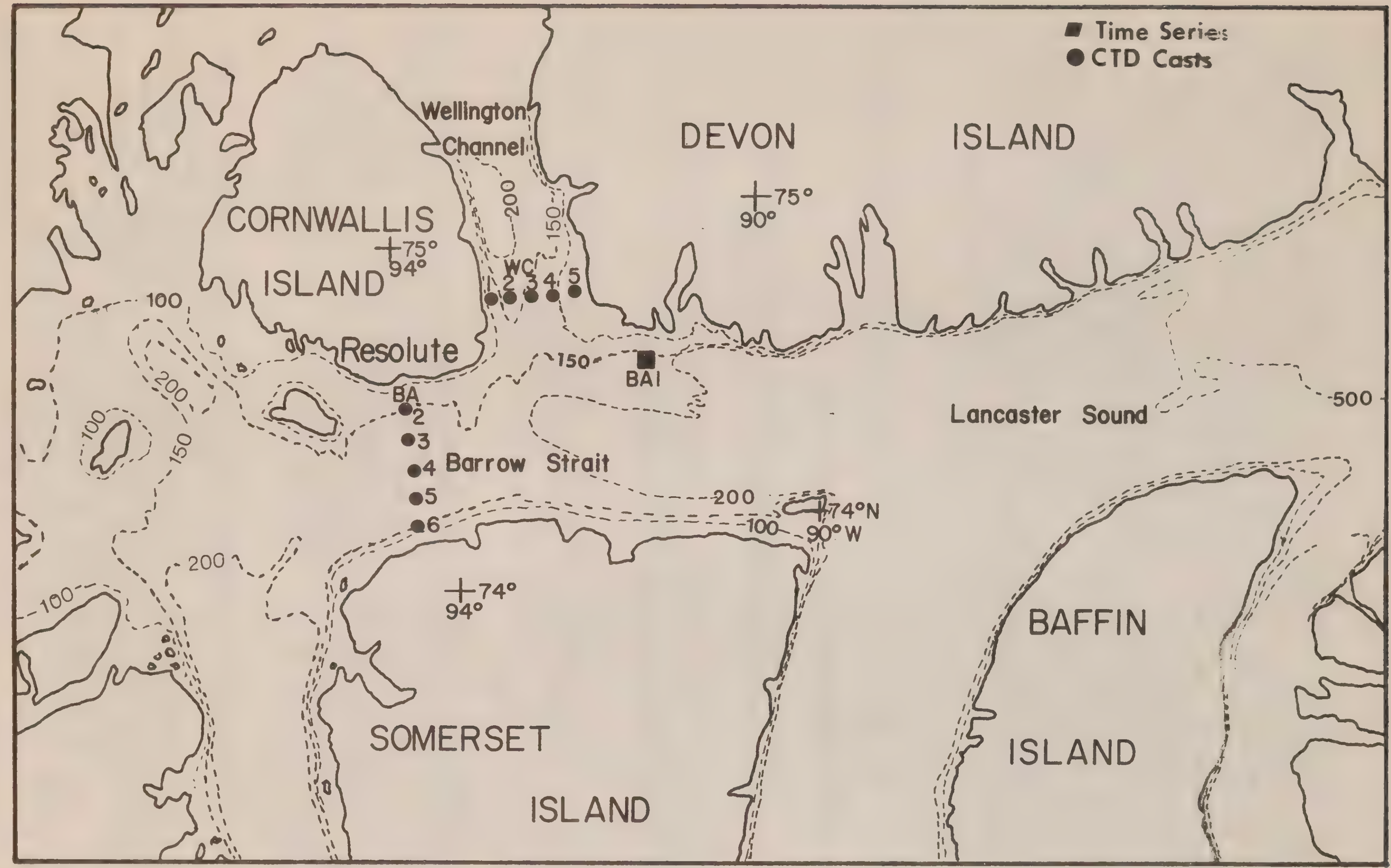


Figure 2: The location of oceanographic stations in Barrow Strait and Wellington Channel. The bathymetry is indicated by the 100, 150, 200 and 500 m depth contours.

Ice coverage data was collected for four locations using ship and air surveillance reports. The data was taken from Swithenbank's (1960) ice atlas compiled from reports up to and including 1958; from Lindsay's (1974) ice atlas compiled from 1960 to 1968 air surveillance flights; and from unpublished ice charts of Ice Central, Department of Fisheries and the Environment, Ottawa for the years 1970 to 1976 inclusive. The four sites chosen coincide with Stations141, 161, 160 and 162 of Swithenbank (1960) which are located in the western, central, and eastern Barrow Strait and Wellington Channel, respectively (see Figure 3). At each station, the ice coverage data was collected for four reporting periods in each month, between mid-June and mid-November. As a result of these variations in both the length of the season between break-up and re-freezing as well as the ice coverage during the season, the number of ice-free days varies considerably through Barrow Strait and Wellington Channel. The average number of ice-free days (N) at each site between June 15 and November 15 was computed using the relation

$$N = 7.825 \sum_{i=1}^{19} P_i(o) + 0.7\, P_i(1\text{-}5) + 0.35\, P_i(5\text{-}8) + 0.1\, P_i(8\text{-}10)$$

where N = no. of ice-free days

$P_i(n)$ = probability of n-tenths ice coverage for ith reporting period (each reporting period is one-quarter of a month).

The number of ice-free days was 78.2 in eastern Barrow Strait, 63.0 in central Barrow Strait, 50.5 in Wellington Channel and only 19.9 in western Barrow Strait over the period June 15 to November 15.

These results indicate that there is markedly less exposure of the water surface to solar insolation in western Barrow Strait than the central and eastern parts of Barrow Strait. Wellington Channel, though break-up and re-freezing occur at approximately the same time as western Barrow Strait, has 250% more ice-free days.

From these many years of observations, some consistent features emerge. The ice break-up occurs first in eastern Barrow Strait, with break-up occurring later as one proceeds to the west. An examination of satellite imagery indicates that break-up in eastern Barrow Strait can occur much earlier than elsewhere in the strait. An ice-edge often forms across Barrow Strait in the vicinity of Prince Leopold Island as early as April with fast ice to the west and little or no ice to the east (J. R. Marko, personal communication).

For the purposes of estimating the incident solar radiation at the water surface, and therefore the amount of local heating during the open water season, it is desirable to know the number of ice-free days at each site under consideration. This quantity depends not only on the length of time between break-up and re-freezing but on the extent of ice coverage during this period as well. Considerable variations are found among the four sites in this respect. During the period when the ice coverage is less than complete or ten-tenths, both eastern Barrow Strait and Wellington Channel are ice-free in most of the reporting years. In about one-half of the years surveyed,

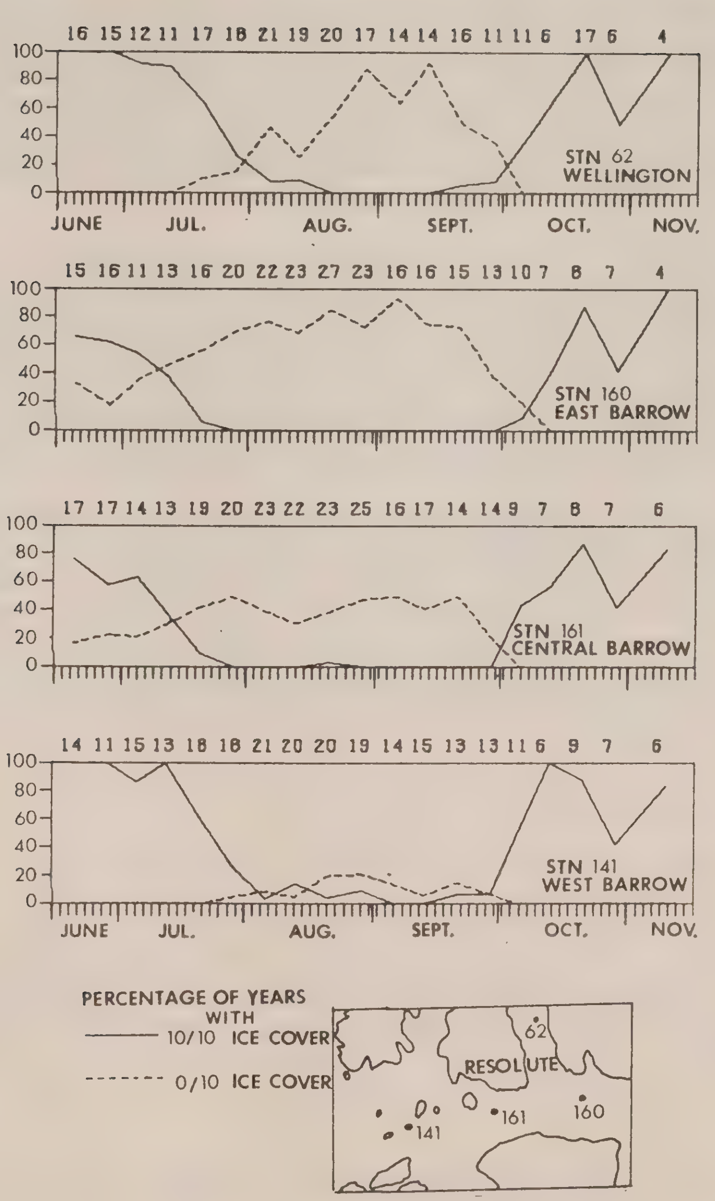


Figure 3: Percentage of years with no ice cover (dashed line) and solid ice cover (solid line) from mid-June to mid-November at four locations. The numbers above each plot are the number of years of observations for each plotted value.

Central Barrow Strait was ice-free (zero-tenths coverage) with the remainder of the years having reports of some ice (greater than zero-tenths and less than ten-tenths). In western Barrow Strait, the number of years which had zero-tenths ice coverage was less then 20% of the total number of years surveyed.

Important differences in ice coverage are found across the channels at the stations discussed above. The 1970-1976 Ice Central Charts show there was a distinct tendency for the ice to be more concentrated on the southern side than the northern side in Barrow Strait and more concentrated in the west side than the east side of Wellington Channel. However, a similar examination of the 1960-1968 ice charts by Lindsey indicated no pronounced differences in either Barrow Strait or Wellington Channel.

In 1972, the year preceding the observations, the ice free season was shorter than average throughout the study area. In western Barrow Strait and Wellington Channel, the ice did not begin to break up until between Aug. 9 and Aug. 16, some three weeks later than usual. Refreezing occurred throughout the area between Sept. 20 and Sept. 27 two to three weeks earlier than normal. As well, during the period between breakup and refreezing, western and central Barrow Strait were more congested with ice than usual.

The 1973 ice-free season was more typical than the short 1972 season. The ice was somewhat late in leaving central and eastern Barrow Strait as the entire region changed from complete ice cover to a partial ice cover between 18 July and 25 July. Through most of the 1973 season, the remaining ice was concentrated on the southern side of Barrow Strait. A complete ice cover did not re-form until after Oct. 17, resulting in an ice-free season that was approximately average in length, though late in starting and late in ending.

2.3 Surface Wind

Knowledge of the surface wind-field in Barrow Strait and Wellington Channel is derivable from the mean pressure distribution over the Arctic Islands and the measured surface winds at Resolute, N.W.T. Neither of these sources of information is entirely satisfactory. The distribution of mean sea level pressure indicates a general flow to the south in the winter months over the entire Arctic Islands. In summer months, the flow to the south persists but is less intense (Anon., 1970). Superimposed on the mean monthly pressure distributions are cyclonic and anti-cyclonic disturbances. These account for most of the fluctuations in the surface wind as measured at Resolute.

Wind statistics gathered over a 10 year period (Anon., 1975) at Resolute indicate that while winds can blow from any direction, winds from directions between the north and northwest and between south and southeast are more common (see Table 1). In most months the northerly winds are most frequent (October to June, inclusive), while the largest mean speeds are recorded in directions around east by southeast over most of the year.

The applicability of the measured winds at Resolute to Barrow Strait remains somewhat uncertain. The terrain around Resolute, gently

RESOLUTE (A), N.W.T.

PERIOD 1963-72 PÉRIODE HEIGHT OF ANEMOMETER 40' HAUTEUR DE L'ANÉMOMÈTRE

	JAN JANV	FEB FEV	MAR MARS	APR AVR	MAY MAI	JUN JUIN	JUL JUIL	AUG AOUT	SEP SEPT	OCT OCT	NOV NOV	DEC DEC	YEAR ANNUEL	
PERCENTAGE FREQUENCY														FRÉQUENCE EN %
N	8	9	8	7	9	10	6	8	18	11	9	8	9	N
NNE	5	4	3	4	6	6	5	4	8	5	5	3	5	NNE
NE	8	8	5	5	5	6	6	4	10	8	10	5	7	NE
ENE	3	3	4	3	3	2	4	2	3	4	5	3	3	ENE
E	5	5	5	6	5	4	6	9	6	6	9	6	6	E
ESE	8	10	10	10	7	7	6	11	6	9	8	9	8	ESE
SE	8	7	11	10	11	8	9	11	5	9	7	11	9	SE
SSE	3	2	4	6	5	4	7	7	2	3	2	4	4	SSE
S	3	3	3	3	4	3	4	5	4	3	3	4	4	S
SSW	1	1	1	1	3	1	1	1	2	3	1	2	1	SSO
SW	1	1	1	1	2	1	1	1	2	3	1	1	1	SO
WSW	*	1	1	1	2	2	3	2	1	3	1	1	1	OSO
W	3	3	2	3	3	8	11	6	3	5	2	3	4	O
WNW	3	5	4	4	5	9	8	8	3	2	2	3	5	ONO
NW	11	11	12	9	9	12	8	8	9	9	9	9	10	NO
NNW	15	15	12	12	13	13	9	8	15	12	12	15	13	NNO
Calm	15	12	14	15	8	4	6	5	3	5	14	13	10	Calme
AVERAGE WIND SPEED IN MILES PER HOUR														VITESSE MOYENNE DES VENTS EN MILLES/HEURE
N	14.0	16.7	13.5	11.9	14.6	14.9	16.0	14.1	16.6	13.4	10.0	11.9	14.0	N
NNE	31.0	25.0	20.7	15.7	19.9	16.2	16.6	17.6	17.8	21.2	16.4	19.0	19.8	NNE
NE	26.8	25.4	20.7	20.1	19.3	17.7	16.4	16.8	18.8	22.1	22.0	23.8	20.8	NE
ENE	20.2	19.9	20.1	16.9	15.8	16.9	18.1	16.3	17.2	18.6	16.2	19.2	18.0	ENE
E	19.5	21.9	23.5	24.2	19.5	18.5	23.9	25.6	21.9	20.9	24.5	24.5	22.4	E
ESE	15.4	19.5	22.0	22.1	20.0	22.6	18.6	21.9	18.7	21.5	18.9	16.5	19.8	ESE
SE	13.6	15.4	15.9	13.4	16.9	17.4	12.7	12.2	14.1	18.0	15.2	15.3	15.0	SE
SSE	14.2	12.2	13.1	12.5	12.6	11.2	9.5	10.1	12.3	14.0	12.0	13.9	12.3	SSE
S	13.3	12.8	14.5	12.1	13.1	9.6	7.6	9.2	13.7	13.5	13.3	16.1	12.4	S
SSW	13.4	12.9	16.4	11.5	12.6	11.0	9.0	11.1	14.3	13.5	14.1	13.6	12.8	SSO
SW	10.7	7.1	11.4	9.4	10.4	12.7	8.3	11.7	11.3	12.3	9.6	11.5	10.5	SO
WSW	7.9	9.3	8.6	11.2	9.9	9.9	10.2	12.3	12.7	13.5	9.2	11.9	10.6	OSO
W	8.8	8.3	8.5	8.8	7.9	9.3	9.6	10.0	11.0	12.8	7.7	9.3	9.3	O
WNW	9.5	8.3	9.3	9.1	8.2	11.2	8.7	10.4	12.6	10.2	8.4	10.3	9.7	ONO
NW	11.3	11.5	11.0	9.3	11.0	12.4	10.7	10.6	15.0	13.3	11.7	11.6	11.6	NO
NNW	12.6	13.9	12.0	10.5	12.9	13.8	16.2	13.9	16.0	14.2	11.0	12.0	13.3	NNO
All Directions	13.5	14.1	13.4	12.3	13.5	13.8	12.6	14.0	15.9	15.6	13.1	13.0	13.7	Toutes directions

Maximum Observed Hourly Speed	88 E	Vitesse horaire maximale observée
Maximum Observed Gust Speed	98	Vitesse maximale observée des rafales
Probable Maximum Gust for Maximum Hourly Speed	119	Rafale maximale en rapport avec vitesse maximale des vents horaires

Table 1: The frequency distribution of measured winds and the average measured wind speed at Resolute, N.W.T. [from *Anon.* (1975)].

rolling with a few hills of 60 to 200 m elevation, may result in some distortion to wind measurements as compared to the wind over the water of Barrow Strait. Danard (1977) has prepared a numerical model to predict winds in Barrow Strait based on rawinsonde winds from Resolute at 850 and 900 mb, the heights and temperatures at these levels from radiosonde data, and the surface temperature at Resolute. For one case only, the model indicates that the largest spatial differences with the Resolute wind are found northwest of Somerset Island, southeast of Resolute and south of Devon Island. The differences are of the order of 30 to 40 degrees in direction and 2 to 4 m/s in wind speed for a north by northwest wind of 8 m/s at Resolute. Clearly, further observations are required to test the model by directly observing spatial differences in the wind field.

2.4 Previous Oceanography

Over the past thirty years, a considerable amount of serial oceanographic data (temperature, salinities and, less often, dissolved oxygen and nutrient concentrations) have been collected in Barrow Strait. A summary of the oceanographic observations in Barrow Strait and Wellington Channel of which we are aware is listed in Table 2. The great bulk of this data has been collected during ice-free periods in the summer months. Prior to this study, the only previous data collected under conditions of fast ice cover was by Milne (1960) at one station in western Barrow Strait. An investigation is at presentunderway by the Ice Physics Group at McGill University which includes oceanographic data gathered in April, 1977 in Barrow Strait.

While a large number of summer observations has been collected, the amount of analysis of this data is rather scanty. Bailey (1957) and Collin (1962) have examined the data collected aboard the CCGS *Labrador* in 1954 and 1957, respectively. Barber and Huyer (1971) compiled an oceanographic atlas of the Canadian Arctic Archipelago based on 1961 and 1962 observations, while a heat budget of Barrow Strait was computed by Huyer and Barber (1970).

Our knowledge of currents in Barrow Strait and Wellington Channel is sketchy, at best,with no direct current measurements having been made prior to this study. According to the Pilot of Arctic Canada (Anon. 1968, Vol. III, p. 261), "The ebb stream sets to the eastward with flood setting in the opposite direction; as there is a general flow of water from west to east through Barrow Strait, the ebb tidal stream has the greater velocity, estimated to be as much as 3 knots" (155 cm/s). Bailey (1957) on the basis of geostrophic computations from the 1954 *Labrador* temperature and salinity data, found "no indication of any strong flow through the strait at the time". At the south end of Wellington Channel, he found the movement of water to be "predominantly southward . . . across the entire section and was strongest on the west side". Collin (1958) found a surface current of 0.2 knots (10.3 cm/s) eastward, with westward surface currents on each side of the strait. Smith (1965), using hydrographic data from the CSS *Baffin* in 1962, inferred currents of both eastward and westward direction which he related to tidal variation. In the central part of Barrow Strait, a net eastward current of 0.4 knots (20.6 cm/s) was estimated. Herlinveaux (1974) reported an easterly surface current in Barrow Strait 10 miles south of Resolute, based

Table 2. Listing of sources of oceanographic data taken in Barrow Strait and Lancaster Sound.

Year	Platform	Reference
1948	USS Eastwind	Metcalfe (1949)
1950	USS Edisto	H.O. Pub. 618-A (Anon., 1954)
1952	USS Edisto	H.O. Pub. 618-A (Anon., 1954)
1954	HMCS Labrador	Bailey (1957)
1956	CCGS Labrador	CODC (unpublished); Collin (1958)
1957	CCGS Labrador	CODC (unpublished); Collin (1962)
1959	Ice Camp	Milne (1960); Herlinveaux (1961)
1960	CCGS Labrador	CODC (1964); Barber (1977)
1961	CCGS Labrador	CODC (1966b)
	CCGS John A. MacDonald	CODC (1966b)
1962	CCGS John A. MacDonald	CODC (1966a)
	"small boat"	CODC (1963)
1962	CSS Baffin	Smith (1965)
1967	CCGS Labrador	CODC (1968)
1968	CCGS Labrador	Herlinveaux (1970)
1970	CSS Hudson	
1972	CCGS Louis S. St-Laurent	Herlinveaux and Wilson (1974)
1973	CCGS Louis S. St-Laurent	Codispoti and Owens (1975)
1973	Ice camp	This Study
1973	CCGS William Alexander	Herlinveaux et al (1977)
1977	Ice camp	Pounder[1]

[1] Personal communication

on ship drift observations, with a speed of approximately 0.6 knots (31.0 cm/s).

To summarize, previous observations of currents in Barrow Strait suggest a net eastward flow, though the currents may have a strong time depend nce.

3. Observation Program

3.1 Ice Camp Measurements

From April 10 to April 27, 1973, a camp was established at 74°30'N, 91°21'W on the landfast ice over water 155 m deep, hereafter referred to as station BA1 (figure 2) and used as a site for oceanographic measurements. The equipment for the ice camp was slung out to the site by a Canadian Forces helicopter. One octagon shaped shelter was erected primarily as an oceanographic and diving facility over a 2.5 m diameter hole blasted in the 2 m thick sea ice. Two winches, used for lowering the CTD (Conductivity, Temperature and Depth Recorder) and current meter probes, were set up within this shelter. The winches were powered by a Briggs and Stratton engine through a specially built hydraulic drive unit (designed by Mr. J.Wilson, Defence Research Establishment Pacific, (DREP), Department of National Defence, Esquimalt, B.C.).

3.1.1 Current Profiles at the Camp

From April 15 to April 19, 1973 inclusive, a total of 27 current profiles measurements was made over the upper 45 m of the water column. Due to a lack of manpower, the sampling times of the current profiles were distributed irregularly over the 5 day period, as illustrated in Figure 4. The profiling current meter had to be modified since the horizontal component of the earth's magnetic field is too small in this area to be effective for a magnetic compass. A Hydro Products Savonius rotor meter normally used with a magnetic compass was locked into position relative to the current meter body. The meter was then attached to a length of torsionally-rigid hydraulic hose and lowered and raised with the direction determined from the hydraulic hose orientation at the surface. The current meter depth was determined from the length of electrical cable payed out and corrected for the wire angle at the surface. At each depth the current meter was suspended at a fixed depth, either 3 m or 45 m, for several hours and the currents recorded.

3.1.2 CTD Profiles and Bottle Casts at the Ice Camp

A total of 24 CTD casts were made at the ice camp from April 18 to April 21, 1973 inclusive. As a check on the CTD casts, two Fjarlie reversing water bottles were used at various depths between 2314 April 20 and 0050 April 21 G.M.T. Reversing thermometers attached to each bottle measured the in situ water temperature while the water samples were collected and later analysed to determine the salinity. These water samples also were analysed for the silicate (SiO_3), nitrate (NO_3) and phosphate content (PO_4).

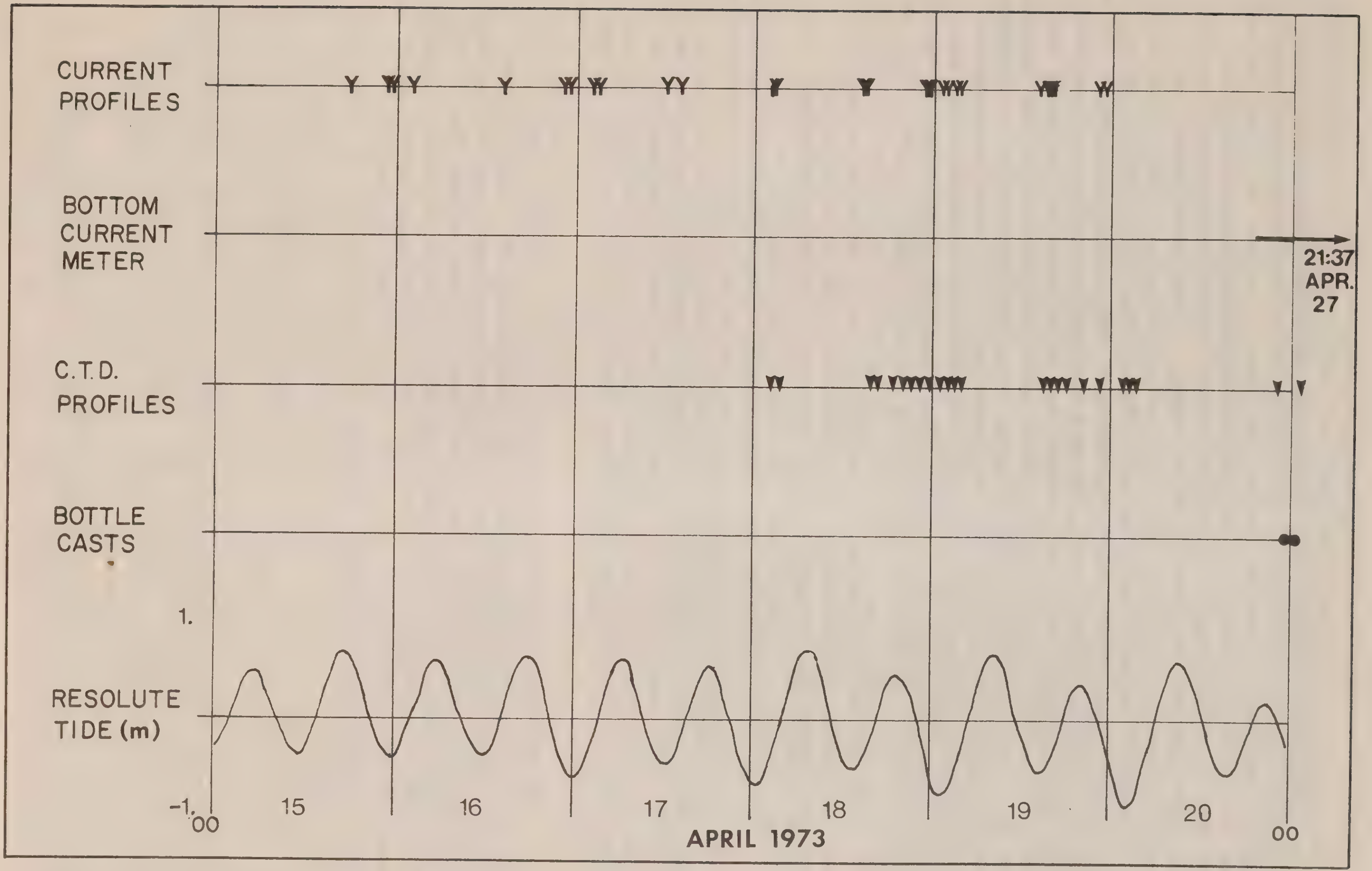


Figure 4: Schematic diagram of the observation times of current profiles, CTD profiles, bottle casts and the bottom current meter. Also shown is the measured tide at Resolute.

3.1.3 Current Meter Measurements at the Ice Camp

An Aanderaa RCM-4 current meter was deployed from the Ice Camp to measure the currents near the bottom. The current meter, located on a rigid bottom mount 2 m above the bottom, was free to rotate with the current, relative to the bottom mount. An artificial horizontal magnetic field, obtained from a rigidly mounted permanent magnet beneath the meter, provided a stable reference for the current meter compass. The bottom mount, in turn, was attached to a trolley used for placing the meter assembly on the bottom. The whole assembly was lowered to the bottom on the trolley which rode on a nylon rope strung between two holes in the ice, 33 m apart, oriented on a line north and south, thereby keeping the trolley on a north-south heading. The rope was strung under the ice between the two holes by shooting a "kite-dart", with a monofilament nylon line attached, from beneath one hole to a target suspended from beneath the other ice hole. The current meter was installed on April 20 and recovered April 27. Unfortunately the timing mechanism failed and as a result the meter sampled erratically at a faster rate than expected. Part of the data record was used, covering the period 0048 GMT Apr. 22 to 20:38 GMT Apr. 27, as described in section 3.3.

The currents 3 m below the bottom of the ice were measured with a Braincon recording current meter. Unfortunately, the film recordings were over-developed by a commercial film processor and the results were lost.

3.2 CTD Profiles across Barrow Strait and Wellington Channel

Working from a Canadian Forces helicopter, five CTD casts were made across Barrow Strait (Station BA2 to BA6 in Figure 1), and another 5 CTD casts were taken across Wellington Channel (Stations WC2 to WC5). The first three CTD casts in Barrow Strait were made on April 22 and completed on April 23. All five Wellington Channel casts were also carried out on April 23.

The helicopter, a Bell 211, is capable of carrying a payload of 2500 lbs including the pilot, co-pilot and flight engineer. The CTD and winch were mounted in the helicopter with the winch placed just inside the door. The 110v AC generator, hydraulic drive unit, boom, block, ice drill, drill motor and shovel were all loaded into the helicopter from its opposite door. Two people operated the CTD and drilled the ice holes, assisted by two members of the helicopter's crew. The procedure was to land the helicopter on the ice - preferably one year ice - take out the AC generator, start the generator and then supply power to heat the CTD sea unit to its operating temperature. The ice hole was drilled and the block assembled on the boom over the ice hole. When the CTD sea unit reached its operating temperature, it was removed from its tank of fresh water where it is normally stored. The sea unit was put in the ice hole and moved up and down by hand until most of the ice was flushed from the hole. The unit was then lowered by gravity to near the bottom and the data was recorded on an X-Y-Y chart recorder in the helicopter. The hydraulic power unit was started up, the hydraulic motor attached to the CTD winch, and the sea unit was hauled up. Finally, the helicopter was reloaded and flown to the next site. During this interval, one of the helicopter's turbines was left running because of starter battery problems, the only effect being that it was somewhat cooler working beneath the rotating blades. As a result, fuel consumption was

excessive which could limit range in other such programs. The time interval between landing at one site and landing at the next site five miles or 8 kilometers away was twenty-five minutes.

3.3 Instruments and Data Processing

3.3.1 CTD and Bottle Casts

The CTD unit consisted of a Guildline 8101 Arctic probe together with a model 8202 deck unit. The data was recorded as analog traces on a two pen drum chart recorder, with the drum being driven by the pressure output signal form the CTD probe. The conductivity signal is proportional to the conductivity of water at the measured depth and temperature, less the conductivity of a sea water sample with a salinity of $33^{o}/oo$, at atmospheric pressure and at the in-situ temperature. According to the manufacturer the instrument is accurate to $\pm0.2\%$ full scale pressure equivalent to ±1.4 m depth, the temperature is accurate to ±0.02 C and the equivalent accuracy of the conductivity output, in terms of salinity is $\pm0.04^{o}/oo$. The corresponding accuracy of the bottle cast data is 0.01 C° in temperature and $\pm0.01^{o}/oo$ in salinity.

The digitized chart records were transferred to computer magnetic tape. Using the CTD profiles (Figure 5) taken immediately before and after the bottle casts, the bottle cast temperatures were fitted to the CTD temperatures at depths where the vertical temperature gradients were small (depths of 10, 20, 30, 150 m). Suitable weights were applied to reflect the elapsed time (up to 2½ hours) between bottle cast and CTD data at each depth. The resulting least squares fit is:

$$T_{bot} = 1.123 \cdot T_{CTD} + 0.212 \qquad (1)$$

with a root mean square of $0.027^{o}C$.

The Guildline 8101 CTD measures a relative conductivity (ΔC) rather than an absolute conductivity (C). The conductivity output from the CTD was fitted to the conductivity of the seawater less the conductivity of a sea water sample of 33 $^{o}/oo$ salinity at 0.0 decibars (dbar) pressure and the in-situ temperature, i.e.

$$(\Delta C)_{CTD} = C(S,T,p) - C\,(33.0^{o}/oo,T,0.0 \text{ dbar}) \qquad (2)$$

where S is the in-situ salinity
T is the in-situ temperature and
P is the in-situ pressure.

The conductivity difference (ΔC) computed from the bottle cast temperature, salinity and depth data was fitted to the conductivity difference measured by the CTD at depths of 0, 10, 75, 100, 125 and 150 m. The resulting lest squares fit is

$$(\Delta C)_{bot} = 1.120 \cdot (\Delta C)_{CDT} + 0.245 \qquad (3)$$

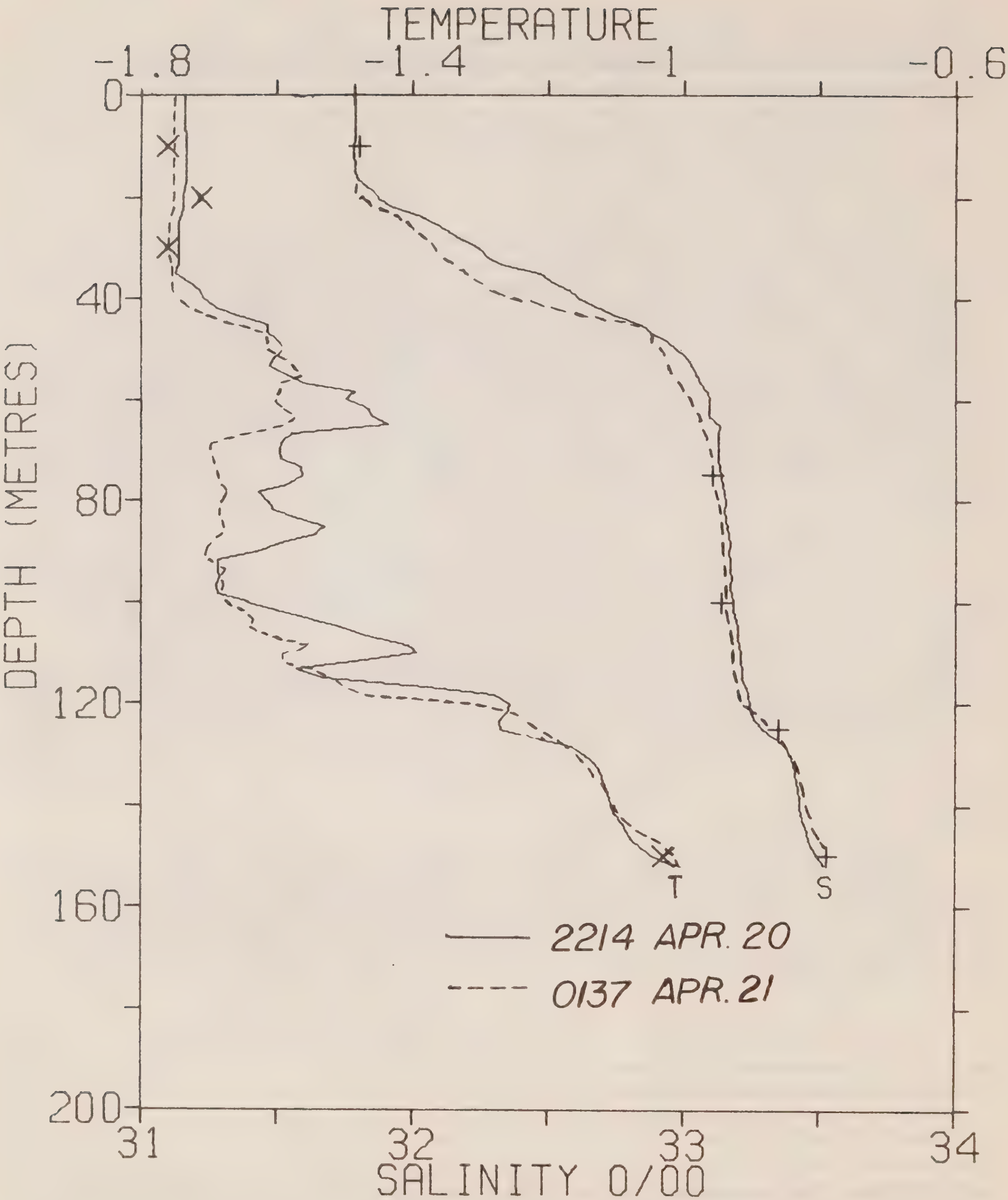


Figure 5: Measurements of temperature and salinity from the bottle cast (plotted symbols) together with the CTD salinity and temperature profiles before (solid line) and after (dashed line) the bottle cast.

where ΔC is in mmho/cm. The root mean square error in the fit was 0.018 mmho/cm. The results of the least squares fits (1) and (3) were then applied as corrections to all of the CTD data. From the conductivity, temperature and pressure readings, the salinity was computed using the Perkin-Walker algorithm (Perkin and Walker, 1972).

All of the digitized salinity, temperature and pressure data is presented in Appendix 1, at the digitization interval of 1.67 m. At each depth, the specific gravity anomaly (SIGMA-T or σ_t) was also computed using Knudsen's formula as quoted by Fofonoff (1962). In addition, at standard depths only, some derived quantities computed from the salinity, temperature and pressure data are presented in Appendix 1. These are:

SVA - Specific volume anomaly computed using Formulae (25) and (26) in Fofonoff (1962)

DEPTH - computed from the SVA values assuming that the water column is hydrostatic

DELTA D - geopotential anomaly in J/kg

POT EN - potential energy in units of 10^8 ergs/cm

SOUND VEL - speed of sound in water computed using formula of Wilson (1960)

The amounts of silicate (SiO_3), nitrate (NO_3) and phosphate (PO_4) in the water samples collected with the bottle casts are listed in Table 3. The Ocean Chemistry Group of the Institute of Ocean Sciences, Patricia Bay, carried out the chemical analysis. The nitrate and phosphate measurements were made on an Auto-analyzer while the silicate content was manually determined following the method described by Strickland and Parsons (1965). The phosphate results may be subject to question as the samples were stored in polythene bottles which tend to absorb or desorb phosphates at the wall of the container (Strickland and Parsons 1965).

3.3.2 Current Profiles

The Hydro Products Savonius rotor current meter used for the current profiles has a speed accuracy of ±1.5 cm/s according to the manufacturer. Because the Savonius rotor has a threshold speed of 2.6 cm/s, recorded speeds below this value are unreliable and therefore set to zero. The direction data was corrected to degrees clockwise from the true north after allowing for the reference direction of the hydraulic hose. These current data were then key-punched onto computer cards for data processing. The current profile data is presented in Appendix 2 as listings and plots of the current vector with time and depth.

3.3.3 Current Meter Data

The Aanderaa RCM-4 current meter has an accuracy of ±5 degrees in direction and ±0.1°C in temperature (manufacturers specification). While the manufacturer does not specify the accuracy of speed measurements, comparisons

Table 3

Temperature, salinity, silicate, nitrate and phosphate data from bottle casts taken between 2314 April 20 and 0126 21 GMT at Station AB01.

Depth (m)	T°C	S°/oo	SiO_3 µg-at/l	NO_3 µg-at/l	PO_4 µg-at/l
0	-	31.791	21	11.9	2.2
10	-1.76	31.805	22	11.5	1.8
20	-1.71	31.833	19	11.1	1.8
30	-1.76	32.119	21	9.7	1.6
50	-1.57	33.030	19	9.6	1.6
75	-1.64	33.104	12	5.1	1.5
100	-1.46	33.141	8	3.2	0.9
125	-1.22	33.349	8	3.1	0.9
150	-1.03	33.530	8	3.0	0.9

with other current meters indicate good performance (Unesco, 1969) with a threshold of 2.2 cm/s. The meter records the data in a digital code on 1/4 inch magnetic tape. After being translated onto computer compatible 9 track magnetic tape, the data was plotted and examined for erroneous values.

The readings recorded by the current meter numbered 9426 rather than the 5254 expected. The first half of the record shows currents that were either very small (less than 3.0 cm/s) or zero. In contrast, the second half of the record indicates a current with speeds up to 20 cm/s and oscillations with diurnal and semi-diurnal frequencies. We hypothesize that when the instrument was started or during the installation, the timing circuit malfunctioned and the meter began recording at higher rate than once every two minutes, possibly at one reading every 27 seconds, the time required for the data encoder to write a complete sequence onto tape. After about 31 hours, the timer circuit reverted to normal operation and the meter began recording every two minutes. This explanation is consistent with the data record. Therefore the current meter data discussed will be limited to the latter half of the recorded data and the measurement times are computed on the basis of the stop time of the instrument and a two minute sampling rate. It should be recognized that the current measurement times are in doubt and that conclusions based on this data are necessarily tentative.

Aside from timing problems, the current data exhibited no obviously erroneous data. For the purpose of this study, the data is subsampled to produce one reading every 10 minutes. This procedure reduces computing costs and increases the least bit resolution of the speed measurements. (The current meter records the cumulative numbers of Savonius rotor revolutions rather than the speed. Therefore, increasing the sampling interval results in an increase of the resolution of the speed data).

4. Observed Distributions

4.1 Water Properties

Using the data from the 34 CTD casts presented in Appendix 1, the vertical structure of the temperature, salinity and density is discussed. We shall examine the spatial variation of these properties across Barrow Strait and Wellington Channel and discuss the time variations of these properties at the ice camp station in Barrow Strait (BA1).

4.1.1 Mean Profiles at Station BA1

Using the temperature and salinity data obtained from the 24 CTD casts at Station BA1, the mean and standard deviation of the temperature, salinity and sigma-t (σ_t) were computed and are displayed in Figure 6. The salinity and σ_t profiles are virtually identical in shape since variations in salinity account almost entirely for variations in σ_t at near freezing water temperatures.

The mean profiles can be characterized by four distinct layers;

a) a surface layer with near-freezing temperatures and a nearly uniform

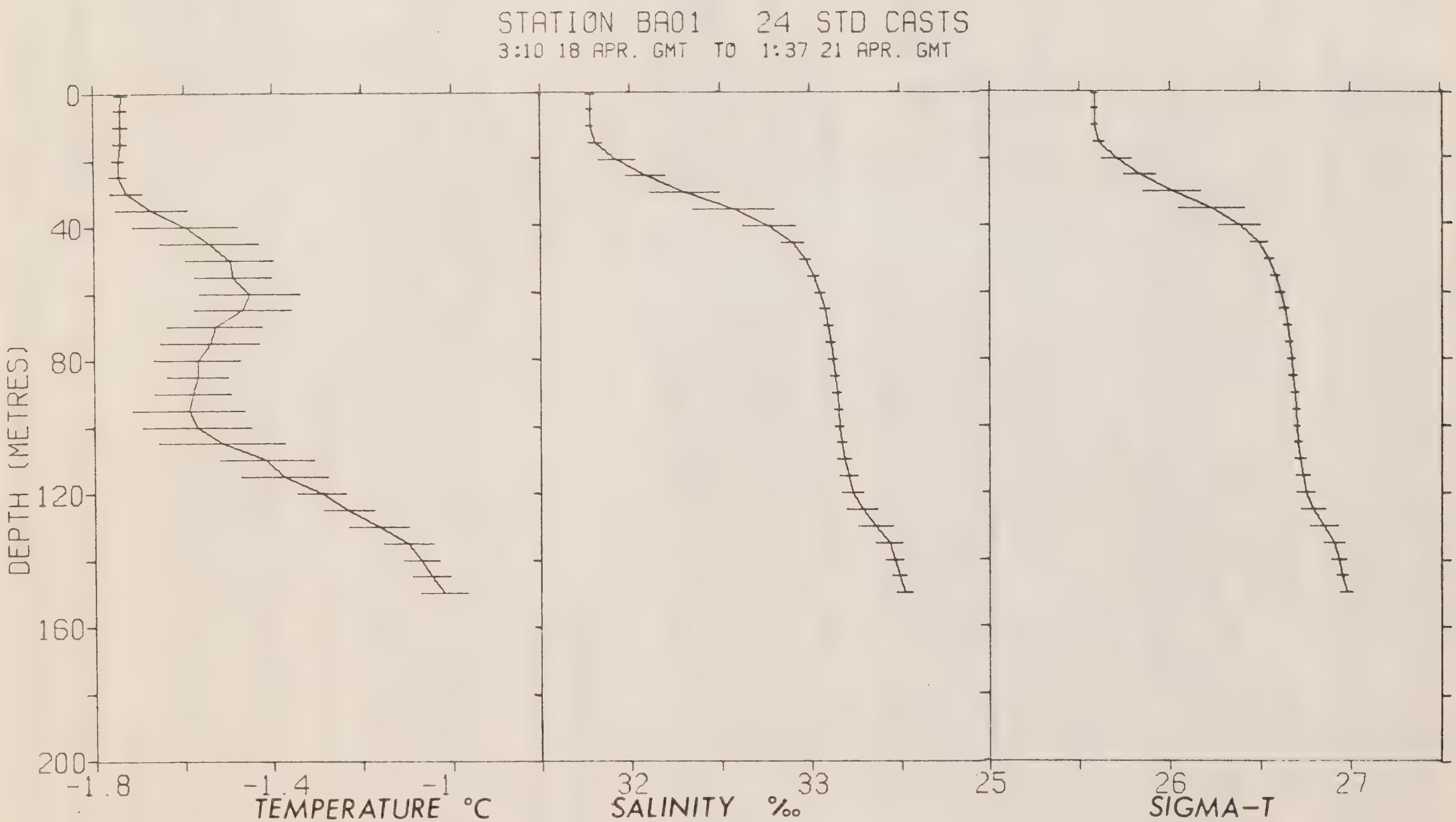


Figure 6: Mean temperature, salinity and sigma-t profiles at station BA1. The horizontal error bars represent standard deviations about the mean values at 5 m depth increments.

salinity of 31.8‰ to a depth of 20 m.

b) a subsurface layer with a pronounced halocline extending from 20 to 50 m depth; the temperature also increases with depth in this layer.

c) a lower layer where the salinity increases more slowly with depth than in the layer above. The salinity averages 32.98‰ at 50 m, and increases to 33.23‰ at 120 m. In the upper part of this layer a temperature maximum is found at an average depth of 60 m with a mean value of -1.45°C. Below this the temperature minimum occurs at a depth of about 95 m with a mean value of -1.59°C. However, as the large standard deviations suggest, the temperatures within this layer exhibit considerable variations in terms of the size of the temperature maximum and minimum. An examination of the individual temperature profiles (Appendix 1) shows that the size of each maximum and minimum fluctuates considerably from one CTD profile to the next. Often, weaker secondary maximums and minimums are found.

d) A bottom layer where the rate of change of salinity with depth increases in comparison to the layer above. This layer extends from 130 m to the bottom at 155 m. While this feature is found in all of the salinity profiles at Station BA1, its form varies from one CTD cast to the next and hence the larger standard deviations in this layer as compared to the layer above.

The observed surface salinities of 31.8‰ in comparison to previous observations in other parts of Parry Channel, suggest a west to east increase in surface salinity under fast ice conditions. Herlinveaux et al (1976) report surface salinities of 31.3‰ or less in the Beaufort Sea off Banks Island in March, 1975 while surface salinities of 31.5 to 31.6‰ have been observed in M'Clure Strait in May, 1966 (CODC, unpublished data). This increase in salinity from west to east may be explained by the higher continental runoff into the Beaufort Sea as compared to the lesser precipitation and drainage area and hence runoff in the Canadian Arctic Islands. Assuming an easterly transport through Parry Channel, mixing of the relatively fresh water of the Beaufort Sea with local water would result in an increase of salinity as the water moves east.

The subsurface layer or halocline layer observed in Barrow Strait covers only 30 m extending from 20 m to 50 m depth. In contrast the subsurface layer in the Arctic Ocean typically spans more than 75 to 100 m in the vertical. The difference appears to arise from the low rate of change of salinity with depth below 50 m depth rather than an abnormally large rate of change of salinity above 50 m depth in comparison with under ice measurements in the western Arctic Ocean. In contrast, similar low rates of change of salinity with depth are found in Baffin Bay off Lancaster Sound in summer although the mean profiles tend to be about 0.2‰ higher in absolute value as shown by unpublished CODC data (1954, 1960, 1961, 1963). Unfortunately, we know of no spring data in western Baffin Bay which would provide for a comparison free of possible seasonal differences. One possible explanation for this low rate of change of salinity with depth below the halocline would be that vertical mixing has occurred within this layer with a resulting reduction in the vertical salinity gradient. The fact that the depth of the lower limit of the layer (120 to 130 m) is approximately the same as the sill depths in Barrow Strait (130 m) and Wellington Channel

(approximately 140 m) adds some support to the vertical mixing hypothesis.

The bottom layer observed at Station BA1 is seen in all of the salinity profiles and most of the temperature profiles. The depth of this feature varies from 125 m to 140 m among the individual profiles. Since the water depth at Station BA1 is 155 m, the bottom layer has a total depth ranging from 15 to 30 m. This bottom layer may simply be an extension of a deeper more saline water mass extending from Lancaster Sound in the east. Because this water is deeper than the sills to the west and the north, it is not affected by the apparent mixing associated with the sills as discussed above. Thus the properties of this bottom layer show a rather abrupt change at the boundary of the two layers with more uniform properties through the layer itself.

4.1.2 Time variations at Station BA1

By examining the data collected from the 24 CTD casts at Station BA1, a preliminary analysis of the temporal variations of salinity and temperature can be made. The CTD casts cover the period 0310 April 18 to 0137 April 21 GMT. Unfortunately, the distribution in time of the measurements is not evenly spaced; there are three gaps of 11 hours or more in the sampling times.

Contours of the computed salinities for all of the CTD casts at Station BA1 (Figure 7) show that the largest variations of salinity occur through the halocline or subsurface layer with smaller variations in the surface layer and lower layer (see Figure 6). Near the bottom, the sizes of the variations increase again. This observed distribution of the amplitude of the salinity variations with depth is consistent with the amplitude variations of internal waves. Internal waves are largest in the region of large vertical gradients of density (and hence salinity).

A rough estimate of the periodicity of the salinity variations can be made by examining the changes in depth of the isohalines plotted in Figure 7. Clearly the variations do not show any one well-defined frequency; however, fluctuations with periods greater than 6 hours seem to be more prevalent than those of shorter period. No obvious change in the periodicities with depth is observed. It should be noted that at this latitude (74.5°N) the periods of any internal tides cannot exceed 12.46 hours, the period of the Coriolis parameter. The M_2 constituent (12.42 hours period) and other semi-diurnal constituents may be present. A more reliable study of the periodicities requires a much longer and more regularly sampled time series.

The temperature variations with time are shown in Figure 7. From the mean profile (Figure 6), the largest standard deviations in temperature are found at mid-depths (35 m to 120 m). These large temperature variations are associated with a temperature maximum at 60 m and a temperature minimum at 95 m depth in the mean profile.

Identifying the core of the warm water as that part of the water column with temperatures above -1.4°C, the depth of the core ranges from 50 to 80 m.

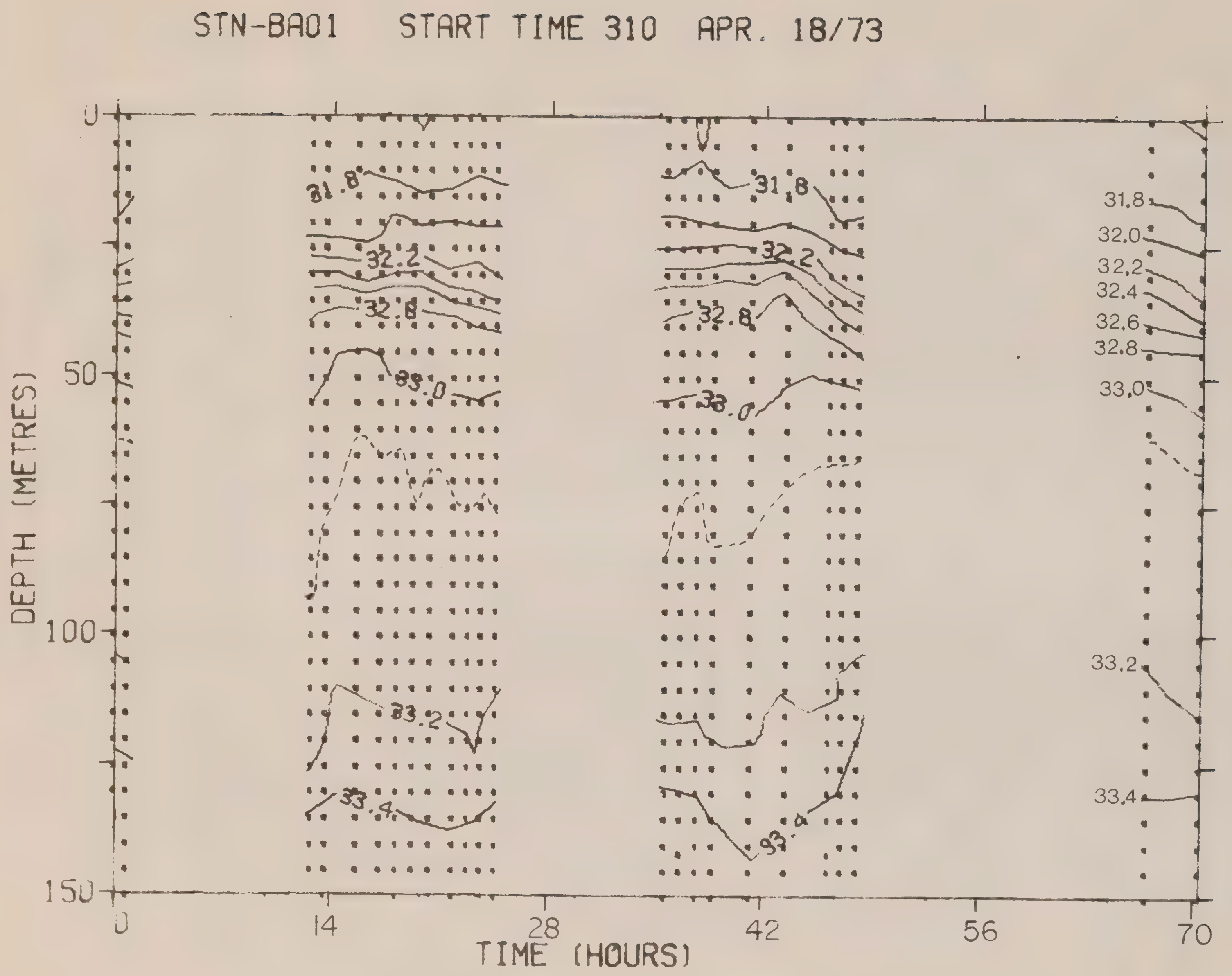
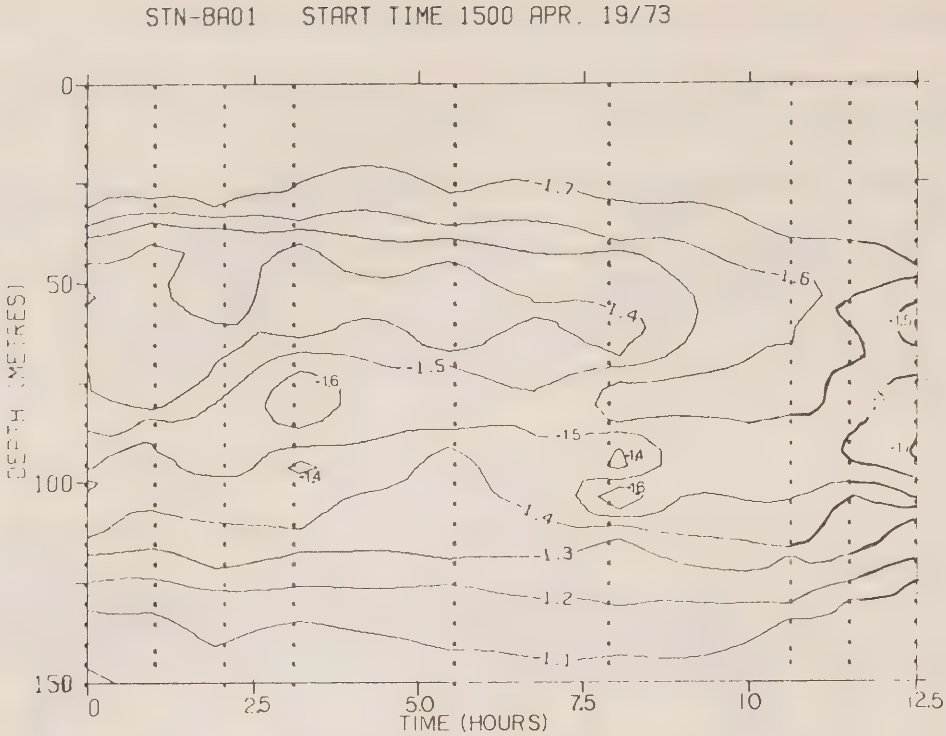


Figure 7: Contours of salinity with time at station BA1.



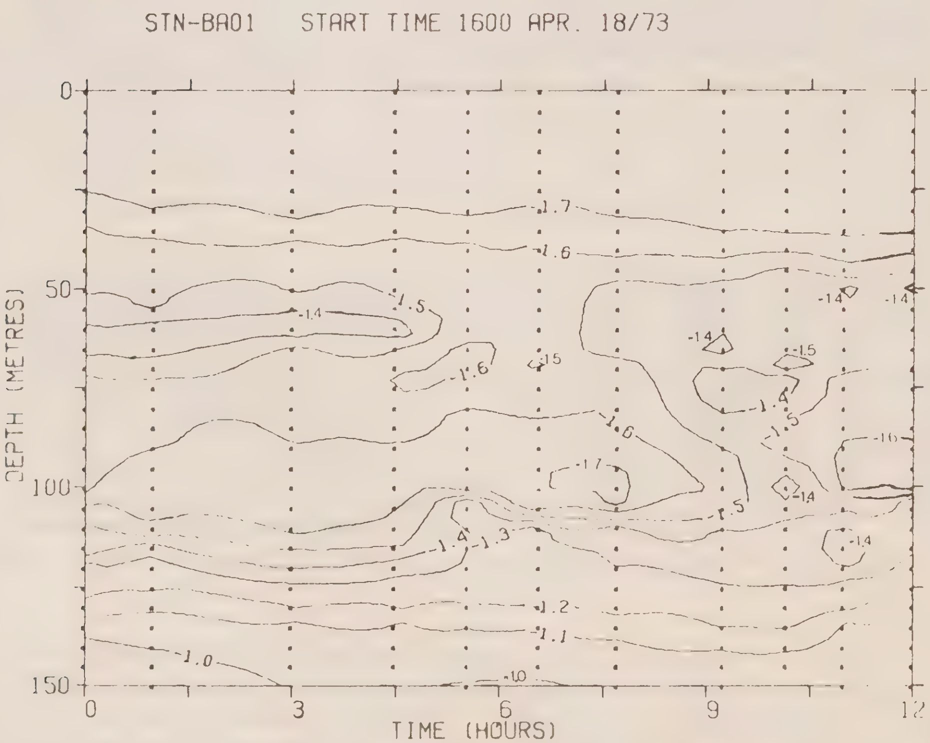


Figure 8: Temperature contours at station BA1 over two periods at station BA1.

The time variations of the temperature maximum and minimum are clearly evident in Figure 8. Both these features are seen to change over periods of several hours; at 1600 April 18 both the maximum and minimum are present. After 6 hours, the maximum virtually disappears for 2-3 hours and then reappears extending to a depth of at least 90 m as the minimum becomes very weak. On the following day (Figure 8), beginning at 1500 April 19 GMT, the temperature maximum is broad and pronounced with a very weak temperature minimum below. After 7 to 10 hours, the maximum weakens and then disappears, leaving cold water (-1.5°C) extending to a depth of 100 m. On the last CTD cast shown in Figure 15, the temperature maximum appears to be re-emerging.

The most likely explanation for this feature would be that a source of relatively warm water exists from which water is advected past the measurement site, accounting for the temperature maximum. Horizontal processes are thought to be more likely than vertical processes due to the large amount of energy required to penetrate the main halocline above the temperature maximum. Either the advecting current or the water source itself or both must be fluctuating with periods of the order of several hours to one day. Other periodicities may well occur but a longer time series record would be required to identify them.

The source region of the warm water is not clear. Across both Wellington Channel and Barrow Strait, similar temperature maxima do not appear. In Wellington Channel, no temperatures were recorded above -1.5°C (Figure 10). The temperatures in the Barrow Strait cross-section (Figure 9) are generally lower than at Station BA1, over the depths of the temperature maxima; however, at the mid-channel station, the temperature does rise above -1.5°C between 55 and 65 m and therefore the warm water could be advected eastward through Barrow Strait but this seems unlikely as the salinities recorded at these depths are 0.4 to 0.5‰ lower than at Station BA1. CTD casts at additional stations, especially in eastern and southern directions, are required to establish the origin of this water.

The ultimate source area of the warm water is unknown. Coachman and Barnes (1961) have shown that Bering Sea water entering the Arctic Ocean in summer sinks and results in a temperature maximum of -1.4°C to -1.2°C between 50 and 100 m depth in the Beaufort Sea. Another possibility is that the warm water is a remnant left over from heating due to solar insolation in the previous summer with wind mixing the warmer water downwards.

By the same reasoning as above, the variable temperature minimum is thought to be advected past the measurement site. From the salinity and temperature data obtained in the transects of Barrow Strait and Wellington Channel, both regions have water with similar properties as those of the temperature minimum. At the central Wellington Channel station (WC3), similar temperatures and salinities are observed from 25 to 130 m depth. At the two northernmost stations in Barrow Strait (BA2 and BA3), similar temperature and slightly lower salinities (by 0.15‰ to 0.2‰) are found at about the same depths.

4.1.3 Cross-section through Barrow Strait

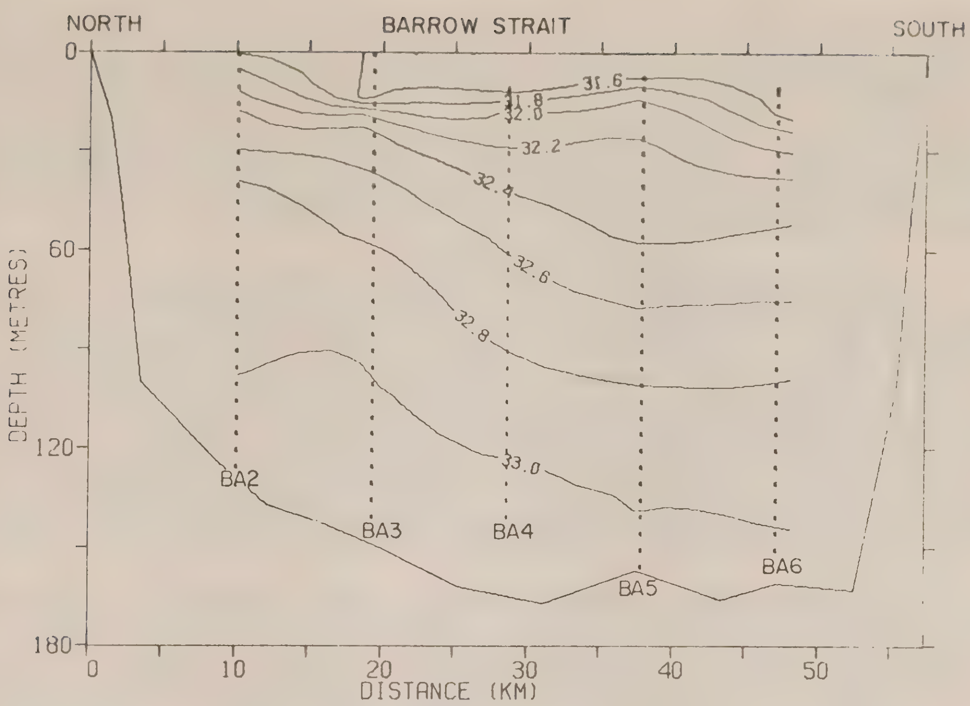
Using the CTD data obtained at Stations BA2 to BA6 (Figure 2), the spatial variations of the temperature, salinity and sigma-t through a cross-section of Barrow Strait are examined. The salinity and temperature data are displayed as contours plotted on a cross-section of the strait (Figure 9) using the computer algorithm of Taylor et al (1971). The depths of the data values used to determine the contours are represented as plotted points. At stations BA4, BA5 and BA6 for depths shallower than 10 m, the conductivity data was not recorded and as a result lack salinity values.

In comparison to the temperature and salinity properties described above at Station BA1, significant differences are found in the Barrow Strait cross-section. The uniform surface layer is shallower; at all 5 stations it is less than 15 m depth and at Station BA2 the depth of water of uniform salinity is less than 2 m. In the lower layer below the main halocline, the salinity is 0.1‰ to 0.5‰ lower in the cross-section than at Station BA1, a significant difference given the small standard deviation of the observed salinities at BA1 as shown in Figure 6. Even at Station BA2 which like Station BA1 is located on the north side of the strait, the salinity is consistently lower by 0.13‰ or more at depths greater than 60 m. This observed difference is consistent with observations taken in the summers of 1961 and 1962 (Barber and Huyer, 1971) where at 75 and 100 m depths, the salinity increases to the east through eastern Barrow Strait. On a larger scale, summer observations indicate a west to east gradient along Parry Channel in the lower layer with typical salinities at 75 m of 32.0 to 32.5‰ in western M'Clure Strait and 33.3 to 33.8‰ in Baffin Bay off Lancaster Sound. Unlike salinity, the temperature shows no consistent differences in the lower layer at the same depths. However, below 130 m, the temperatures measured through the Barrow Strait cross-section are colder than at Station BA1 by 0.1 to 0.4 C°.

The bottom layer observed at Station BA1 (as described in the previous section) is also found in the vertical profiles at Stations BA5 and BA6 (Appendix 1) but not at Stations BA2 and BA3. At Station BA4, there is a sharp increase in salinity at the bottom of the profile which may be associated with this feature. At Stations BA5 and BA6, the bottom layer is deeper (beginning at 145 m) than at Station BA1 (125 to 140 m) and less saline (33.1‰ compared to 33.4 - 33.5‰).

The salinity distribution across Barrow Strait in Figure 9 shows that the salinity generally increases from the south to the north side of the strait. The difference in salinity between Stations BA2 and BA6 ranges from 0.8‰ at 20 m to 0.2‰ at 135 m depth. Since sigma-t is almost entirely determined by variations in salinity, the distribution of sigma-t across the strait is virtually identical to that of the salinity. If we assume that a geostrophic balance exists between the Coriolis force and the horizontal pressure gradient (as inferred from the density field), the distribution of density across the strait suggests that there is an eastward flow through almost the entire cross-section relative to the flow near the bottom.

It should be noted that this consistent slope in the isohalines



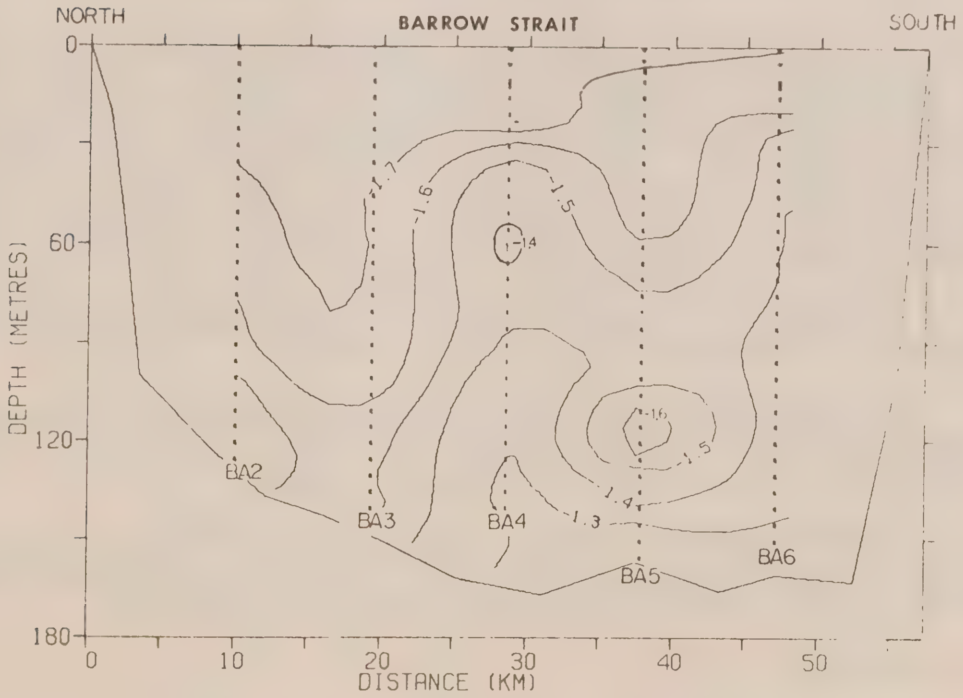


Figure 9: Distribution of salinity and temperature through a cross-section of Barrow Strait.

and hence isopycnals seems to be real and not due to confusion of time variations with spatial variations. Over a period of four days relatively small changes in the salinity were observed at Station BA1. Taking these time variations as representative of those that would be encountered at Station BA2 to BA6, simple calculations show that the consistent change in sigma-t across the strait is greater than changes due to the time-variations of temperature and salinity.

The computed baroclinic volume transport through Barrow Strait between Stations BA2 and BA6 is 0.3 ± 0.09 Sverdrups [Sv] (1 Sv = $10^6 m^3/s$) relative to the 125 m geopotential level. The quoted uncertainty of ± 0.09 Sv is due to the assumed temporal variations and does not include measurement error, or deviations from a geostrophic balance. It should be noted that the density distribution as inferred from Figure 9 indicates that there is a horizontal pressure gradient at 125 m depth and no obvious level of no-motion exists in the strait. As a result, it must be emphasized that the sign and magnitude of the calculated volume transport are relative values only.

The geostrophic method provides only a tentative estimate of volume transport and underscores the need for direct current meter measurements in order to determine the total volume transports and their temporal variability. Since most channels of the Arctic Islands are relatively shallow, direct current measurements will be increasingly relied on for volume transport estimates.

4.1.4 Cross-section through Wellington Channel

The salinity and temperature distributions in Wellington Channel (Figure 10) differ markedly from those in Barrow Strait. In Wellington Channel, the surface salinities are higher with a mean of 32.44‰ at 10 m depth against 31.69‰ at 10 m depth in the Barrow Strait cross-section and 31.78‰ at Station BA1. The salinity profiles below the main halocline at depths greater than 40 m are remarkable for their near uniformity with depth. An examination of the individual profiles in Appendix 1 indicates that from 40 m depth downwards, the increase in salinity is less than 0.1‰ in each of the 5 profiles. Because of this, the stratification (i.e. change in density as a function of depth) is small and little energy would be required to induce vertical movements in the water column.

The temperatures measured in Wellington Channel are uniformly cold ranging from the freezing point up to -1.56°C. Unlike Barrow Strait, the temperatures show very little warming with depth.

The uniformity of both the temperature and salinity structure in Wellington Channel implies that baroclinic volume transport and baroclinic geostrophic currents through Wellington Channel are very small.

4.2 Currents

4.2.1 Bottom Currents

The currents 2 m above the bottom at Station BA1 measured over a 6 day period are displayed in Figure 12 with the statistics given in Table 4. Twice-daily reversals are found in the current direction with the flow being

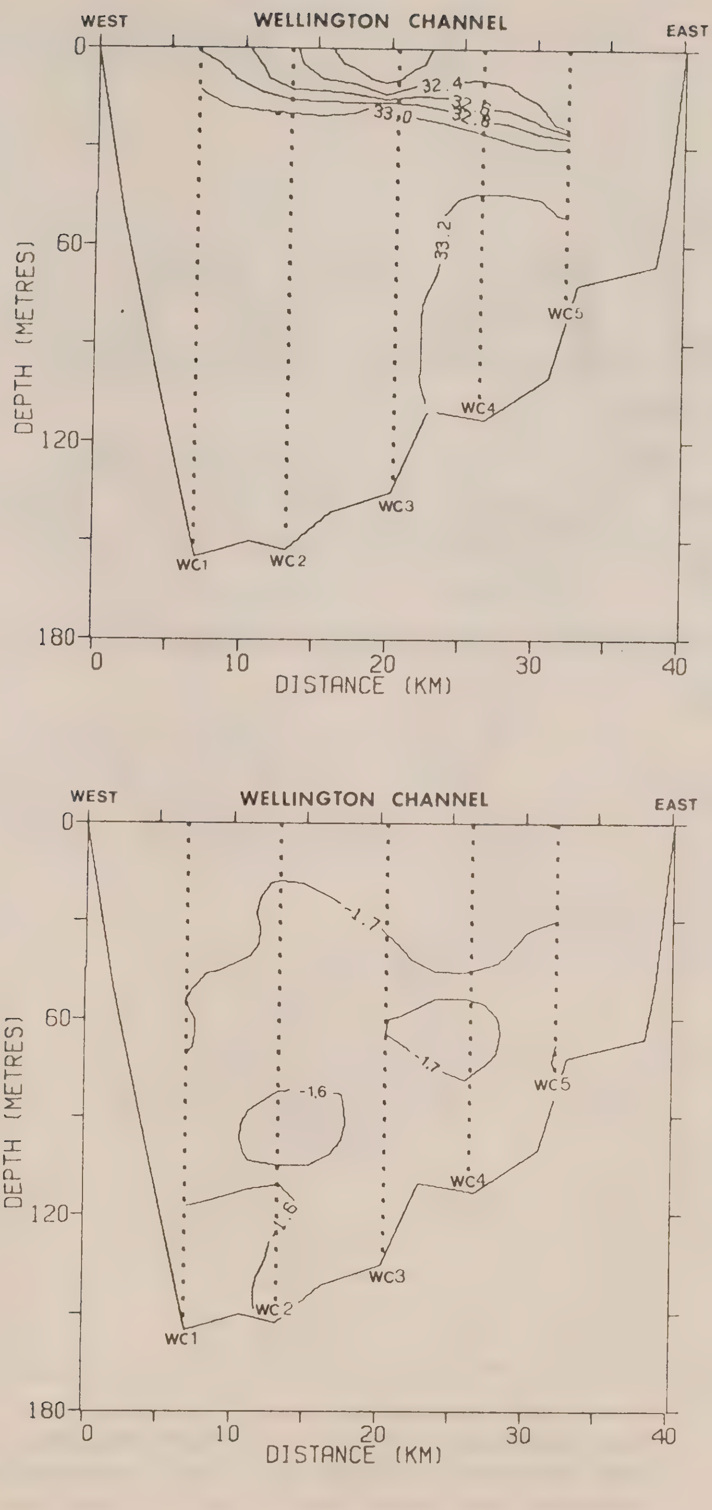


Figure 10: Distribution of salinity and temperature through a cross-section of Wellington Channel.

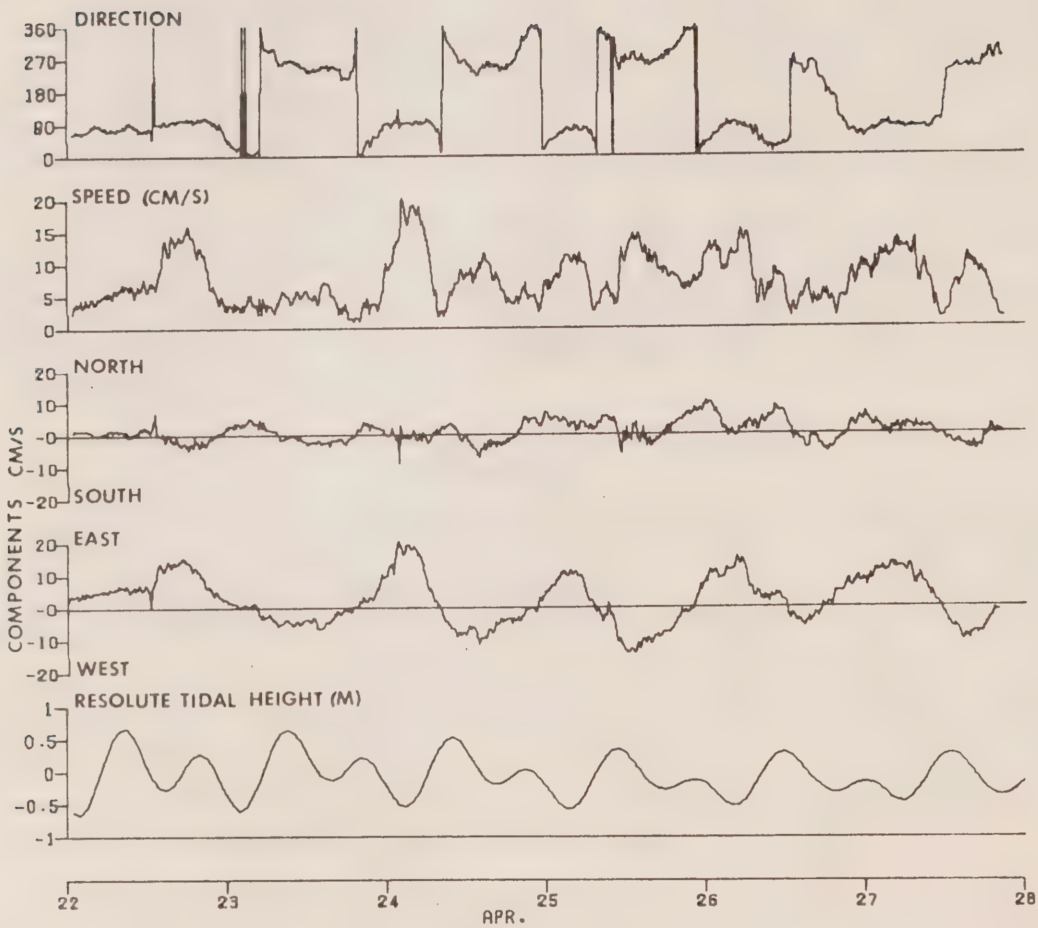


Figure 12: The direction, speed, north-south current component and east-west current component measured 2 m above the bottom at station BA1. Also plotted is the measured sea level variations at Resolute, N.W.T.

Table 3: Statistics of the current meter measurements at Station BA 2 at a depth of 153 m (2 m above the bottom).

No. of readings - 840
First reading at 00.48 Apr.22 GMT
Last reading at 20.38 Apr.27 GMT

Sampling interval - 10 min.

	Temperature C	Speed cm/s	E-W Comp. cm/s	N-S Comp. cm/s
Mean	-1.59	7.5	2.0	0.8
Std.Dev	0.03	3.8	7.5	3.1
Maximum	-1.54	20.2	20.2	10.1
Minimum	-1.64	1.0	-14.4	-8.9

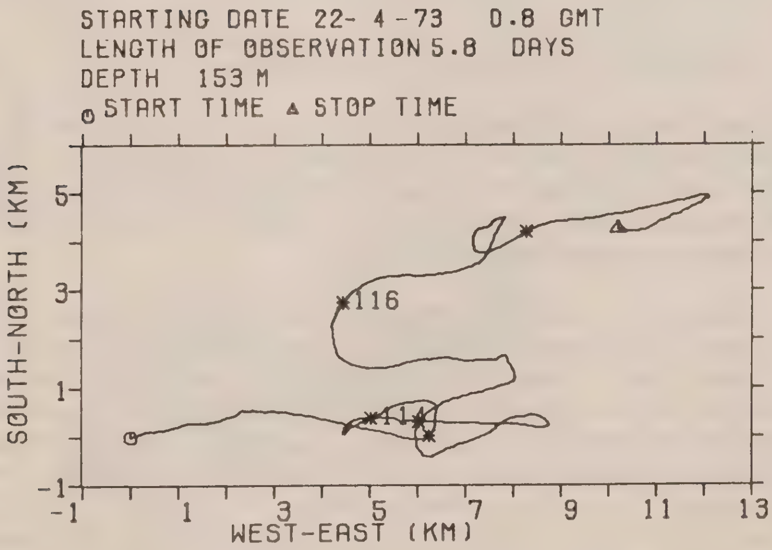


Figure 11: Progressive vector diagram of bottom currents at station BA 1.

bimodal; either nearly eastward or westward. The recorded speeds range from 1.0 cm/s to 20.2 cm/s about a mean of 7.5 cm/s. In comparison, the variations in the speed are less regular than the direction signal with large day to day changes. The north-south current component is small with a mean and standard deviation of 0.8 ± 3.1 cm/s. Due to the regular direction reversal, the east-west component has a marked diurnal character with a mean and standard deviation of 2.0 ± 7.5 cm/s.

The low frequency behaviour of the current is seen in the progressive vector diagram (Figure 11) where a net drift to the east at a mean rate of 2.2 cm/s of 1.9 km/day is found. The major part of the net drift occurs on April 22 and April 26 with a confused and reversing pattern being experienced on the other days.

The short record of current observations obtained in this study suggests that the near bottom currents are a mixture of tidal currents and less regular and longer period currents. It is interesting that the observed periodicity is diurnal while the known tides in the area are mixed diurnal and semi-diurnal (Dohler, 1964). However, for this particular time period, the tidal height record at Resolute is characterized by two daily peaks with one being considerably larger than the other; as a result, the tidal height record has a pronounced diurnal character. The less regular variations in the current record which seem to be associated with periods larger than one day are particularly noticeable in the speed record. Further time series measurements are required to gain some insight into the nature of these; both for longer periods at one depth and at other depths throughout the water column.

4.2.2 Current Profiles at Station BA1.

A great amount of variability is found among the 28 individual current profiles, each of which is displayed in Appendix 2. Currents above about 20 m depth are observed to have directions in all four quadrants. The deeper current measurements, down to 45 m, tend to have directions in the southeast or southwest quadrants.

In Figure 13, the difference between the current direction at various depths and the current direction at 45 m depth is plotted for all of the current profiles. Among the individual profiles, the current direction relative to 45 m depth varies considerably. The mean value of the relative current direction at each depth is small, ranging from -9° (25 m) to 13° (6 m) but the standard deviation is remarkably large, exceeding 40° at all depths above 35 m and reaching values of 70° to 110° above 10 m depth. Within individual profiles, differences in direction of 90° or more are not uncommon. In a few profiles, a monotonic change in direction with depth is evident; both clockwise and anti-clockwise turning of the current vector occurs. Most profiles, however, do not exhibit a consistent turning in direction with depth.

Current speeds of up to 44 cm/s are measured at 40 and 45 m depth. At shallower depths, the maximum observed currents decrease with 18 cm/s being the largest speed measured at 3 m depth.

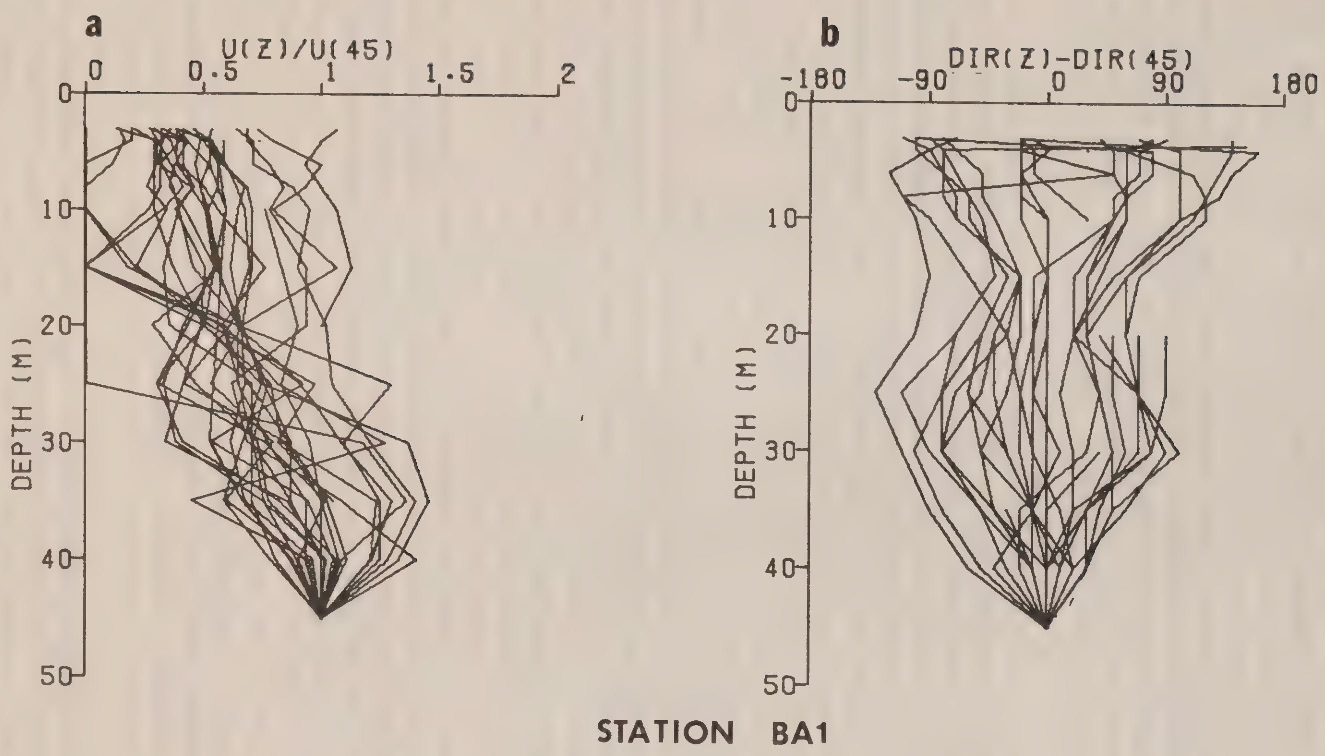


Figure 13: (a) 28 individual profiles of the ratio of the measured current speed at each level to that of the current speed at 45 m depth.

(b) 28 individual profiles of the current direction less the measured direction at 45 m depth for speeds exceeding 2.5 cm/s.

The individual current-speed profiles are presented in Figure 14 as the ratio of the current at each measurement-depth to the current measured at 45 m depth. The current ratio exhibits somewhat less variability among the individual current profiles with a maximum in the speed rates at 40 m depth (1.04 ± 0.16) and then a consistent decrease as one moves upwards with a speed ratio ± standard deviation of 0.60 ± 0.21 at 20 m, 0.47 ± 0.28 at 10 m, and 0.37 ± 0.24 at 3 m depth.

The variability among the current profiles shows that the currents in this region are complex in nature. No simple relation between tidal heights at Resolute and currents appears to exist when the individual profiles in Appendix 2 are examined. A longer and more evenly sampled record of current profiles is required to identify the physical mechanisms producing the variations.

These results emphasize the need for both experimental and theroetical studies of the currents beneath the ice. We have seen that the current at one depth in the upper 45 m of the water column may not be representative of the current several metres above or below the measurement level. A knowledge of the vertical structure of the currents is necessary to monitoring the movement of pollutants beneath the ice.

5. Summary and Conclusions

Oceanographic measurements were obtained in Barrow Strait and Wellington Channel, N.W.T., in April, 1973 under the condition of solid ice cover. From CTD and bottle casts, the variations of temperature, salinity and density were studied. Currents were observed by means of a self-recording current meter, mounted just above the bottom, and repeated profiles of the currents over the upper 45 m.

On the basis of the bottle and CTD cast data, the water column in Barrow Strait can be divided into four distinct layers according to the salinity and, therefore, the density structure. These are a surface layer, characterized by uniform salinities and near-freezing temperatures, a sub-surface layer with a pronounced halocline, a lower layer where the salinity increases more slowly with depth than in the layer above, and a bottom layer characterized by a larger increase in salinity with depth. While these layers are almost always found at each station, the depth of the layers varies markedly from one position to another. However, repeated casts at one station showed that the salinity structure varied little with time over a 3-day period.

Significant spatial gradients in salinity are found along Barrow Strait with the largest differences occurring in the lower layer below the main halocline. Being located below the halocline, one can surmise that these differences in salinity are related to horizontal processes such as advection rather than vertical processes being driven by surface exchanges.

By applying the geostrophic assumption, spatial differences observed in the salinity values through a cross-section of Barrow Strait suggest that an eastward flow exists through almost the entire cross-section

of Barrow Strait relative to the flow near the bottom. However, a reliable quantitive estimate of the flow is not possible because the data indicates a level of no motion does not exist in the strait and because of the possible confusion between temporal and spatial changes.

Pronounced differences in salinity across Wellington Channel are limited to the upper 30 m of the water column. Below this level, the salinity of Wellington Channel is very nearly uniform across the strait indicating that only a very weak (if any) baroclinic geostrophic current exists through most of the cross-section. Also noteworthy in Wellington Channel is the almost neutral stability of the water column below the main halocline.

An intermittent temperature maximum and minimum is found at station BA1 in the lower layer from repeated CTD casts. The temperature maximum is centered at approximately 60 m depth while the temperature minimum is generally found at about 95 m depth. While these features are relatively small in scale, typically having departures of 0.2 C^{o} or less from the temperatures above and below, they can be interpreted as being representative of physical processes occurring in this part of the water column. The maximum and minimum vary with time; they are present over periods of several hours, disappear and then re-emerge a few hours later; this behavior suggests that a time scale of approximately 10 hours or more charactrizes the phenomena. While horizontal advection of water of differing properties past the measurement site seems the most likely explanation for the existence of the temperature maximum and minimum, repeated time series measurements of salinity and temperature at one or more locations together with a dense spatial network of CTD casts would be required to test this hypothesis.

The near (2 m) bottom currents at station BA1 are weak (20 cm/s or less) and exhibit a diurnal variation in direction but less regular changes in speed. The measured currents in the upper 45 m are complex in nature. The current speed tends to increase with increasing depth; the maximum observed current is 44 cm/s at 45 m depth. The current directions are extremely variable with time, particularly in the upper 10 m. Furthermore, even currents observed in the same individual profile can differ by 40^{o} or more over depths of 10 m. No systematic rotation of the current with depth is observed.

From this study we see that the oceanographic conditions of the region of Barrow Strait adjacent to Wellington Channel are far from simple even under solid ice cover. As a result, far more questions are raised in this study than are answered. With the increasing economic and commercial activity in the Parry Channel area of the Canadian Arctic Islands, it is desirable to improve our knowledge of the oceanography of the area so as to be in a position to assess the environmental impact of these activities.

Studying the ocean when it is covered by solid ice presents a special advantage for oceanographic studies; the existence of a solid platform on the surface from which to work. Instruments can be suspended from this platform and oriented relative to it.

Based on the results of this study, further oceanographic

investigations in this region should have the following elements. Time series measurements of currents at fixed depths are needed since geostrophic estimates of the currents and water transport are not reliable in the relatively shallow channels of the Canadian Arctic. Therefore, direct measurements from moored current meters are required which would provide the temporal variations in the current. At present, we lack adequate information to determine the necessary spatial distribution of meters to adequately sample the transport through a channel. The results of this study suggest that near the surface (depths less than 45 m) several current meters through the water column are needed at each station. As this would amount to a prohibitive number of current meters needed for the entire width of the entire channel, current profiles obtained from one current meter would be used to supplement the fixed position current meter data.

In addition, significant variations in temperature and salinity are present which should be further studied. In addition to being important for their own sake, it may be possible to use water properties, including temperature, salinity and nutrient measurements, as tracers for horizontal and vertical movements of water. In doing so, it is essential not to confuse temporal and spatial variations; we have shown this problem can be avoided by the use of a helicopter equipped with a winch and CTD. In this study, the total elapsed time between two CTD stations at sites separated by 8 km was 25 minutes. Monitoring of the time variations at least at one site can be achieved by means of repeated CTD casts or, preferably, the use of thermistor and conductivity chains.

Measurements of silicate and phosphates have been used by Codispoti and Owens (1975) to formulate a budget of these respective nutrients for the Arctic Ocean. Their results indicate that 60% of the Bering Strait inflow to the Arctic Ocean exits through Lancaster Sound into Baffin Bay. Measurements of nutrients could be used to test their results and to attempt to devise more localized budget studies for the Arctic Islands.

Ultimately, theoretical analysis could be made of the increasing observations to devise analytical or numerical models of the oceanography of the Canadian Arctic.

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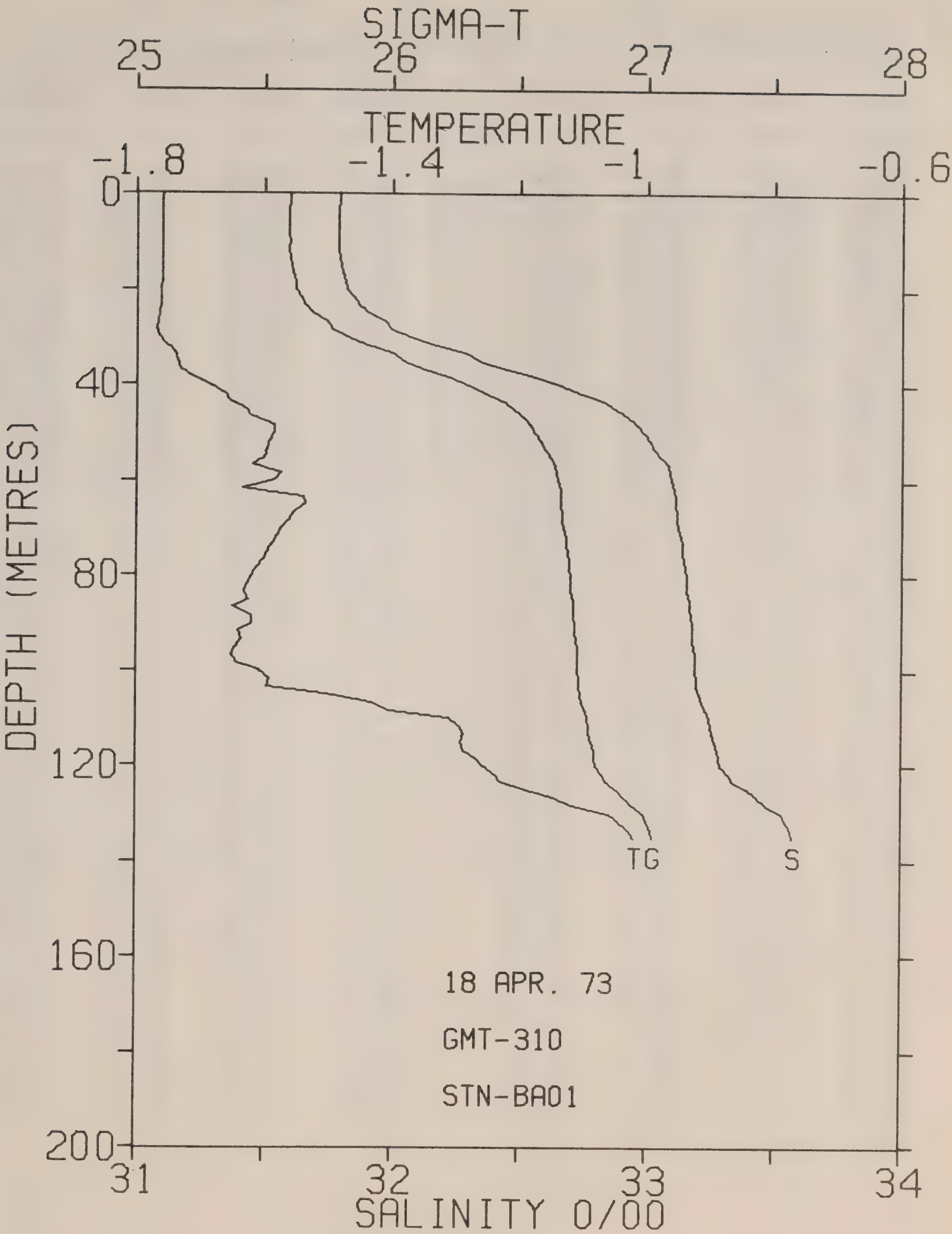
Appendix 1

CTD Profiles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26
27
28
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120
160
200
TG
S
18 APR. 73
GMT-310
STN-BA01
31
32
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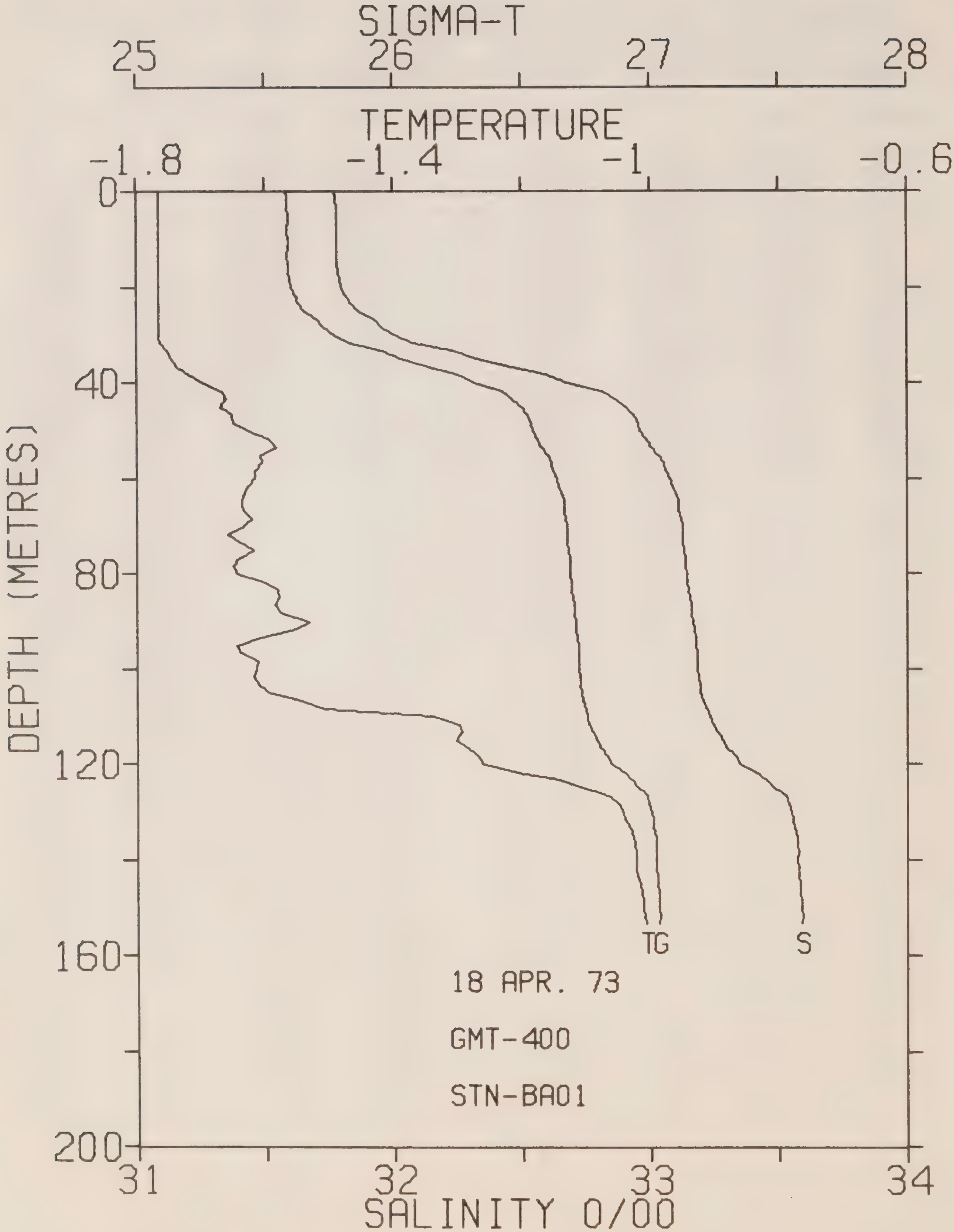
SALINITY 0/00

REFERENCE NO. 73-473- 1 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 3.2
RESULTS OF STD CAST 82 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.76	31.80	25.60	68.33	-1.56	33.12	26.67
1.67	-1.76	31.79	25.60	70.00	-1.57	33.12	26.67
3.33	-1.76	31.79	25.60	71.67	-1.58	33.14	26.68
5.00	-1.76	31.79	25.60	73.33	-1.59	33.14	26.69
6.67	-1.76	31.79	25.59	75.00	-1.60	33.14	26.69
8.33	-1.76	31.79	25.60	76.67	-1.60	33.15	26.69
10.00	-1.76	31.79	25.60	78.33	-1.61	33.15	26.69
11.67	-1.76	31.79	25.60	80.00	-1.62	33.15	26.70
13.33	-1.76	31.80	25.60	81.67	-1.63	33.16	26.70
15.00	-1.76	31.80	25.60	83.33	-1.63	33.16	26.70
16.67	-1.76	31.81	25.61	85.00	-1.62	33.17	26.71
18.33	-1.76	31.82	25.62	86.67	-1.65	33.17	26.71
20.00	-1.76	31.82	25.62	88.33	-1.62	33.17	26.71
21.67	-1.76	31.85	25.65	90.00	-1.62	33.18	26.72
23.33	-1.76	31.87	25.66	91.67	-1.64	33.18	26.72
25.00	-1.76	31.91	25.69	93.33	-1.64	33.18	26.72
26.67	-1.77	31.97	25.74	95.00	-1.64	33.19	26.73
28.33	-1.77	32.00	25.77	96.67	-1.65	33.19	26.73
30.00	-1.76	32.07	25.82	98.33	-1.64	33.19	26.73
31.67	-1.75	32.17	25.91	100.00	-1.61	33.19	26.73
33.33	-1.74	32.29	26.00	101.67	-1.59	33.20	26.73
35.00	-1.74	32.35	26.05	103.33	-1.60	33.20	26.73
36.67	-1.73	32.45	26.13	105.00	-1.50	33.20	26.74
38.33	-1.71	32.56	26.22	106.67	-1.43	33.22	26.75
40.00	-1.68	32.66	26.30	108.33	-1.40	33.24	26.76
41.67	-1.66	32.74	26.37	110.00	-1.31	33.25	26.77
43.33	-1.65	32.83	26.44	111.67	-1.29	33.25	26.77
45.00	-1.63	32.88	26.48	113.33	-1.29	33.26	26.77
46.67	-1.62	32.92	26.51	115.00	-1.29	33.27	26.78
48.33	-1.59	32.96	26.54	116.67	-1.29	33.28	26.79
50.00	-1.58	32.99	26.56	118.33	-1.27	33.28	26.80
51.67	-1.59	33.01	26.58	120.00	-1.26	33.29	26.80
53.33	-1.60	33.03	26.60	121.67	-1.24	33.32	26.83
55.00	-1.60	33.06	26.62	123.33	-1.23	33.34	26.84
56.67	-1.62	33.08	26.64	125.00	-1.19	33.40	26.89
58.33	-1.57	33.09	26.65	126.67	-1.15	33.43	26.91
60.00	-1.59	33.10	26.65	128.34	-1.12	33.47	26.94
61.67	-1.63	33.10	26.66	130.00	-1.06	33.53	26.99
63.33	-1.54	33.11	26.66	131.67	-1.04	33.55	27.00
65.00	-1.54	33.11	26.66	133.34	-1.03	33.57	27.02
66.67	-1.55	33.12	26.67	135.00	-1.02	33.57	27.02

REFERENCE NO. 73-473- 1 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 3.2
RESULTS OF STD CAST 82 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.76	31.80	0	25.60	239.4	0.0	0.0	1437.
1	-1.76	31.79	1	25.60	239.8	0.02	0.00	1437.
3	-1.76	31.79	3	25.60	240.2	0.07	0.00	1437.
5	-1.76	31.79	5	25.60	240.3	0.12	0.00	1437.
7	-1.76	31.79	7	25.59	240.2	0.17	0.01	1437.
10	-1.76	31.79	10	25.60	239.9	0.24	0.01	1437.
15	-1.76	31.80	15	25.60	239.4	0.36	0.03	1437.
20	-1.76	31.82	20	25.62	237.4	0.48	0.05	1437.
30	-1.76	32.07	30	25.82	218.3	0.71	0.11	1437.
50	-1.58	32.99	50	26.56	147.9	1.06	0.25	1440.
75	-1.60	33.14	74	26.69	136.1	1.41	0.47	1440.
100	-1.61	33.19	99	26.73	131.9	1.75	0.77	1441.
125	-1.19	33.40	124	26.89	117.1	2.06	1.13	1444.

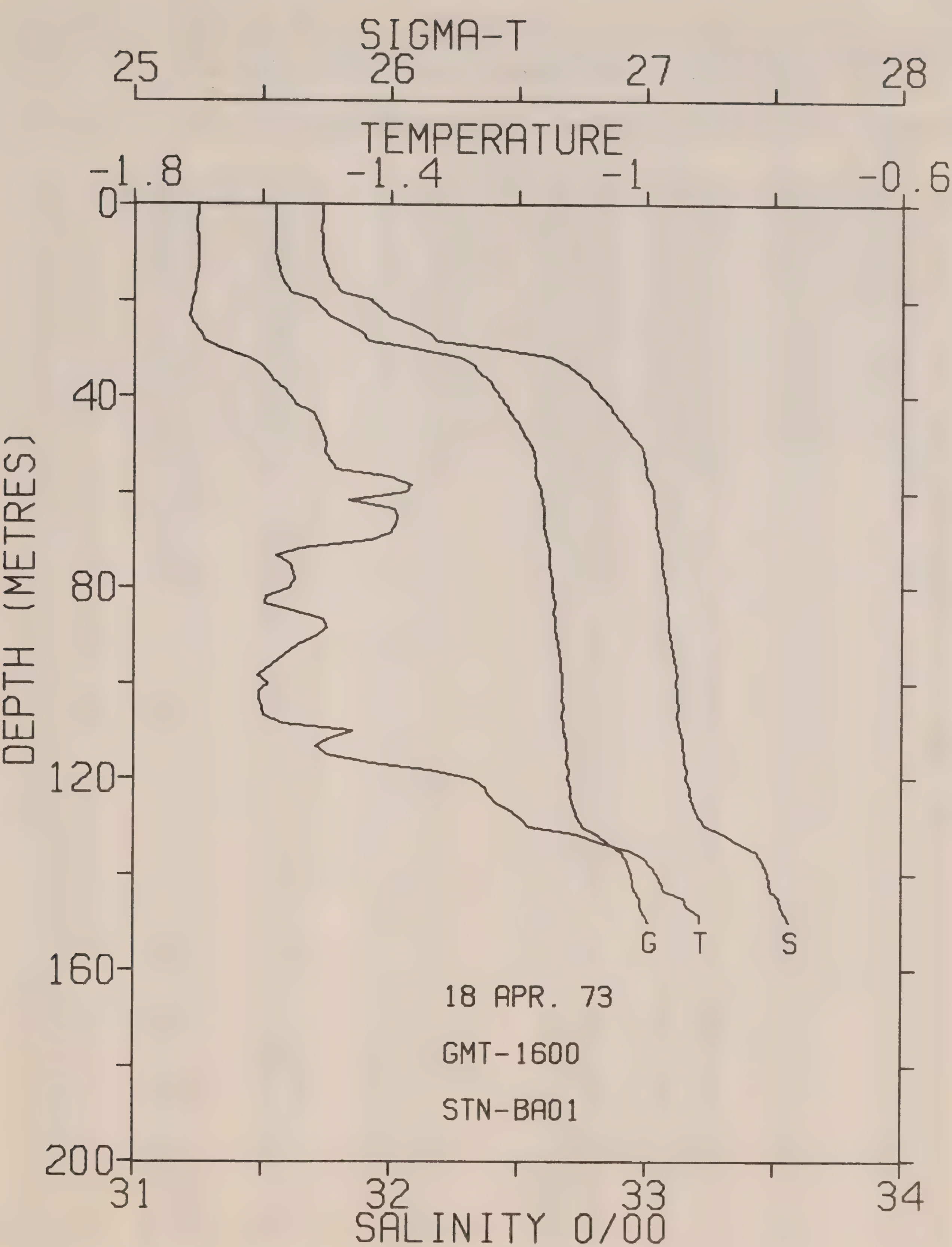

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
TG
S
18 APR. 73
GMT-400
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 2 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 4.0
RESULTS OF STD CAST 93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.76	31.77	25.58	78.33	-1.65	33.14	26.69
1.67	-1.76	31.78	25.59	80.00	-1.64	33.14	26.69
3.33	-1.76	31.78	25.59	81.67	-1.60	33.15	26.69
5.00	-1.76	31.78	25.59	83.33	-1.58	33.15	26.70
6.67	-1.76	31.78	25.59	85.00	-1.58	33.16	26.70
8.33	-1.76	31.78	25.59	86.67	-1.59	33.16	26.70
10.00	-1.76	31.78	25.59	88.33	-1.57	33.16	26.71
11.67	-1.76	31.78	25.59	90.00	-1.53	33.17	26.71
13.33	-1.76	31.78	25.59	91.67	-1.55	33.17	26.71
15.00	-1.76	31.79	25.59	93.33	-1.61	33.18	26.72
16.67	-1.76	31.79	25.59	95.00	-1.64	33.18	26.72
18.33	-1.76	31.79	25.60	96.67	-1.64	33.18	26.72
20.00	-1.76	31.80	25.61	98.33	-1.61	33.18	26.72
21.67	-1.76	31.82	25.62	100.00	-1.61	33.18	26.72
23.33	-1.76	31.84	25.64	101.67	-1.62	33.19	26.73
25.00	-1.76	31.86	25.66	103.33	-1.61	33.19	26.73
26.67	-1.76	31.93	25.71	105.00	-1.60	33.19	26.73
28.33	-1.76	31.96	25.74	106.67	-1.54	33.21	26.74
30.00	-1.76	32.00	25.77	108.33	-1.51	33.22	26.75
31.67	-1.76	32.08	25.84	110.00	-1.34	33.23	26.76
33.33	-1.75	32.24	25.96	111.67	-1.30	33.24	26.76
35.00	-1.74	32.33	26.03	113.33	-1.29	33.26	26.78
36.67	-1.73	32.47	26.15	115.00	-1.30	33.28	26.79
38.33	-1.72	32.60	26.25	116.67	-1.28	33.30	26.81
40.00	-1.70	32.68	26.32	118.33	-1.27	33.33	26.83
41.67	-1.67	32.82	26.43	120.00	-1.26	33.35	26.85
43.33	-1.66	32.86	26.46	121.67	-1.21	33.41	26.90
45.00	-1.67	32.91	26.50	123.33	-1.14	33.45	26.93
46.67	-1.65	32.93	26.52	125.00	-1.10	33.48	26.95
48.33	-1.65	32.95	26.54	126.67	-1.07	33.53	26.99
50.00	-1.62	32.96	26.54	128.34	-1.05	33.54	27.00
51.67	-1.60	32.98	26.56	130.00	-1.04	33.55	27.00
53.33	-1.58	33.00	26.58	131.67	-1.04	33.56	27.01
55.00	-1.61	33.04	26.60	133.34	-1.03	33.56	27.01
56.67	-1.61	33.05	26.62	135.00	-1.03	33.57	27.02
58.33	-1.62	33.06	26.62	136.67	-1.02	33.57	27.02
60.00	-1.62	33.08	26.64	138.34	-1.02	33.58	27.02
61.67	-1.63	33.09	26.65	140.00	-1.02	33.57	27.02
63.33	-1.63	33.10	26.66	141.67	-1.02	33.58	27.02
65.00	-1.64	33.11	26.67	143.34	-1.02	33.58	27.03
66.67	-1.63	33.11	26.67	145.00	-1.02	33.58	27.03
68.33	-1.62	33.12	26.67	146.67	-1.01	33.59	27.03
70.00	-1.63	33.13	26.68	148.34	-1.01	33.59	27.04
71.67	-1.66	33.13	26.68	150.00	-1.01	33.59	27.03
73.33	-1.64	33.13	26.68	151.67	-1.01	33.59	27.04
75.00	-1.62	33.13	26.68	153.34	-1.01	33.59	27.03
76.67	-1.64	33.14	26.69				

REFERENCE NO. 73-473- 2 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 4.0
RESULTS OF STD CAST 93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.76	31.77	0	25.58	241.1	0.0	0.0	1437.
1	-1.76	31.78	1	25.59	241.0	0.02	0.00	1437.
3	-1.76	31.78	3	25.59	240.7	0.07	0.00	1437.
5	-1.76	31.78	5	25.59	240.5	0.12	0.00	1437.
7	-1.76	31.78	7	25.59	240.6	0.17	0.01	1437.
10	-1.76	31.78	10	25.59	240.5	0.24	0.01	1437.
15	-1.76	31.79	15	25.59	240.3	0.36	0.03	1437.
20	-1.76	31.80	20	25.61	239.1	0.48	0.05	1437.
30	-1.76	32.00	30	25.77	223.4	0.71	0.11	1437.
50	-1.62	32.96	50	26.54	149.8	1.07	0.25	1440.
75	-1.62	33.13	74	26.68	136.4	1.42	0.47	1440.
100	-1.61	33.18	99	26.72	132.5	1.75	0.77	1441.
125	-1.10	33.48	124	26.95	110.7	2.07	1.13	1444.
150	-1.01	33.59	149	27.03	102.9	2.33	1.50	1445.

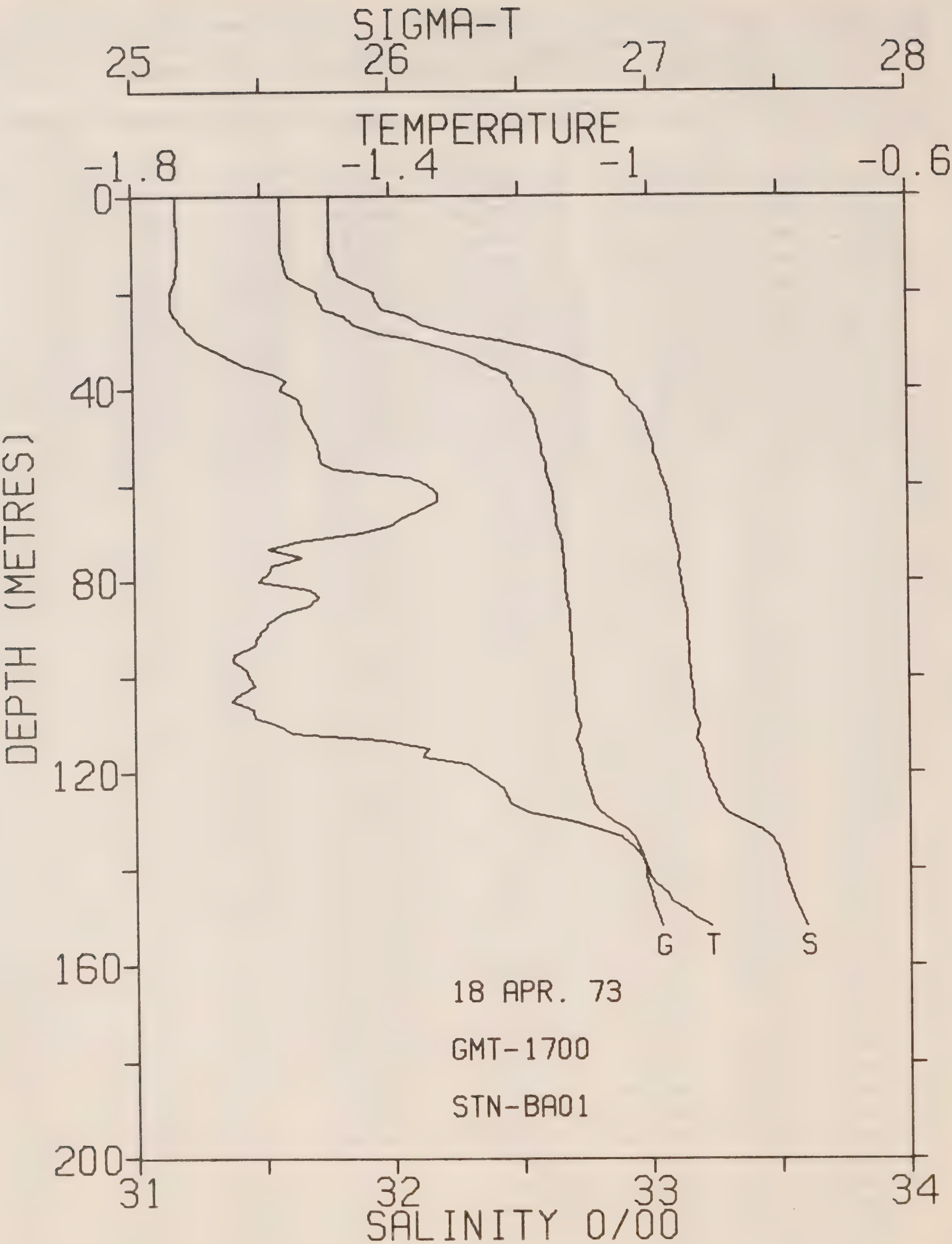

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
G
T
S
18 APR. 73
GMT-1600
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 3 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 16.0
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.70	31.73	25.55	76.67	-1.55	33.07	26.63
1.67	-1.70	31.73	25.55	78.33	-1.55	33.07	26.63
3.33	-1.70	31.73	25.55	80.00	-1.56	33.08	26.64
5.00	-1.70	31.73	25.55	81.67	-1.59	33.08	26.64
6.67	-1.70	31.73	25.55	83.33	-1.60	33.08	26.64
8.33	-1.70	31.73	25.55	85.00	-1.54	33.08	26.64
10.00	-1.70	31.73	25.55	86.67	-1.51	33.09	26.64
11.67	-1.70	31.74	25.55	88.33	-1.50	33.09	26.65
13.33	-1.70	31.75	25.57	90.00	-1.52	33.10	26.65
15.00	-1.70	31.76	25.57	91.67	-1.54	33.10	26.66
16.67	-1.70	31.78	25.59	93.33	-1.56	33.11	26.66
18.33	-1.71	31.81	25.61	95.00	-1.58	33.11	26.66
20.00	-1.71	31.93	25.71	96.67	-1.59	33.11	26.67
21.67	-1.71	31.96	25.73	98.33	-1.61	33.12	26.67
23.33	-1.71	32.00	25.77	100.00	-1.59	33.12	26.67
25.00	-1.71	32.08	25.83	101.67	-1.60	33.12	26.67
26.67	-1.70	32.15	25.89	103.33	-1.60	33.12	26.67
28.33	-1.69	32.18	25.91	105.00	-1.60	33.13	26.68
30.00	-1.66	32.41	26.10	106.67	-1.60	33.12	26.67
31.67	-1.63	32.62	26.27	108.33	-1.57	33.13	26.68
33.33	-1.61	32.69	26.32	110.00	-1.46	33.13	26.68
35.00	-1.59	32.73	26.35	111.67	-1.50	33.14	26.69
36.67	-1.58	32.77	26.39	113.33	-1.52	33.15	26.69
38.33	-1.57	32.79	26.40	115.00	-1.50	33.15	26.69
40.00	-1.55	32.82	26.43	116.67	-1.43	33.15	26.69
41.67	-1.55	32.85	26.45	118.33	-1.34	33.16	26.70
43.33	-1.52	32.87	26.47	120.00	-1.27	33.16	26.69
45.00	-1.51	32.90	26.49	121.67	-1.25	33.17	26.70
46.67	-1.51	32.92	26.51	123.33	-1.25	33.17	26.70
48.33	-1.50	32.94	26.53	125.00	-1.23	33.18	26.71
50.00	-1.50	32.98	26.55	126.67	-1.21	33.20	26.72
51.67	-1.50	32.99	26.56	128.34	-1.20	33.21	26.73
53.33	-1.49	32.99	26.57	130.00	-1.18	33.24	26.76
55.00	-1.48	33.00	26.57	131.67	-1.11	33.30	26.81
56.67	-1.40	33.00	26.57	133.34	-1.07	33.36	26.85
58.33	-1.37	33.02	26.58	135.00	-1.02	33.43	26.90
60.00	-1.38	33.03	26.59	136.67	-1.00	33.45	26.92
61.67	-1.46	33.03	26.59	138.34	-0.99	33.47	26.93
63.33	-1.39	33.04	26.60	140.00	-0.98	33.48	26.94
65.00	-1.39	33.04	26.60	141.67	-0.98	33.49	26.95
66.67	-1.39	33.04	26.60	143.34	-0.97	33.49	26.95
68.33	-1.40	33.04	26.60	145.00	-0.94	33.52	26.98
70.00	-1.43	33.05	26.61	146.67	-0.93	33.53	26.98
71.67	-1.54	33.06	26.62	148.34	-0.92	33.55	27.00
73.33	-1.58	33.06	26.62	150.00	-0.92	33.56	27.01
75.00	-1.56	33.06	26.62				

REFERENCE NO. 73-473- 3 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 16.0
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.70	31.73	0	25.55	244.4	0.0	0.0	1437.
1	-1.70	31.73	1	25.55	244.7	0.02	0.00	1437.
3	-1.70	31.73	3	25.55	244.7	0.07	0.00	1437.
5	-1.70	31.73	5	25.55	244.8	0.12	0.00	1437.
7	-1.70	31.73	7	25.55	244.6	0.17	0.01	1437.
10	-1.70	31.73	10	25.55	244.5	0.24	0.01	1437.
15	-1.70	31.76	15	25.57	242.5	0.37	0.03	1437.
20	-1.71	31.93	20	25.71	229.6	0.49	0.05	1437.
30	-1.66	32.41	30	26.10	192.4	0.70	0.10	1438.
50	-1.50	32.98	50	26.55	149.1	1.03	0.24	1440.
75	-1.56	33.06	74	26.62	142.2	1.39	0.47	1441.
100	-1.59	33.12	99	26.67	137.5	1.74	0.78	1441.
125	-1.23	33.18	124	26.71	133.6	2.08	1.16	1443.

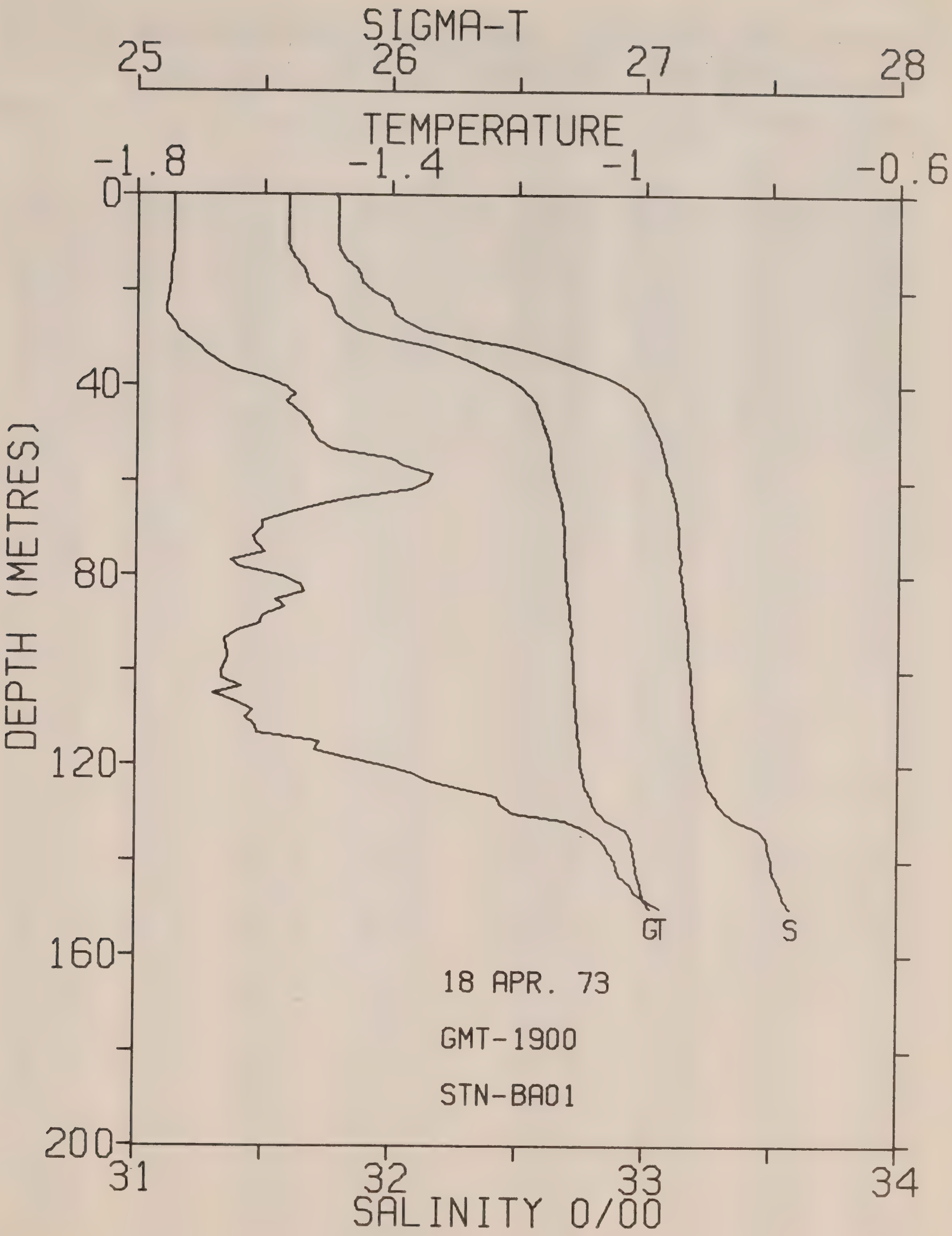

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
G T S
18 APR. 73
GMT-1700
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 4 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 17.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.73	31.77	25.58	76.67	-1.59	33.11	26.67
1.67	-1.73	31.77	25.58	78.33	-1.59	33.12	26.67
3.33	-1.73	31.77	25.58	80.00	-1.61	33.12	26.67
5.00	-1.73	31.77	25.58	81.67	-1.53	33.13	26.67
6.67	-1.73	31.77	25.58	83.33	-1.51	33.13	26.68
8.33	-1.73	31.77	25.58	85.00	-1.53	33.14	26.68
10.00	-1.73	31.76	25.58	86.67	-1.57	33.14	26.69
11.67	-1.73	31.77	25.58	88.33	-1.59	33.14	26.69
13.33	-1.73	31.78	25.59	90.00	-1.60	33.14	26.69
15.00	-1.73	31.79	25.59	91.67	-1.61	33.15	26.69
16.67	-1.73	31.80	25.61	93.33	-1.61	33.15	26.69
18.33	-1.73	31.87	25.66	95.00	-1.64	33.15	26.70
20.00	-1.74	31.94	25.72	96.67	-1.65	33.15	26.70
21.67	-1.74	31.95	25.72	98.33	-1.63	33.15	26.70
23.33	-1.74	31.97	25.75	100.00	-1.62	33.16	26.70
25.00	-1.73	32.07	25.82	101.67	-1.61	33.16	26.70
26.67	-1.72	32.12	25.86	103.33	-1.63	33.16	26.71
28.33	-1.71	32.24	25.96	105.00	-1.65	33.17	26.71
30.00	-1.70	32.42	26.11	106.67	-1.62	33.17	26.71
31.67	-1.68	32.57	26.23	108.33	-1.61	33.18	26.72
33.33	-1.65	32.67	26.31	110.00	-1.58	33.19	26.73
35.00	-1.63	32.74	26.37	111.67	-1.55	33.18	26.72
36.67	-1.59	32.84	26.44	113.33	-1.42	33.18	26.71
38.33	-1.56	32.87	26.47	115.00	-1.34	33.20	26.73
40.00	-1.57	32.88	26.48	116.67	-1.35	33.21	26.73
41.67	-1.55	32.91	26.50	118.33	-1.29	33.21	26.74
43.33	-1.54	32.94	26.53	120.00	-1.27	33.22	26.74
45.00	-1.54	32.97	26.55	121.67	-1.24	33.23	26.75
46.67	-1.53	32.98	26.56	123.33	-1.23	33.24	26.76
48.33	-1.52	32.99	26.57	125.00	-1.22	33.26	26.77
50.00	-1.52	33.00	26.57	126.67	-1.22	33.27	26.78
51.67	-1.51	33.01	26.58	128.34	-1.19	33.30	26.80
53.33	-1.51	33.02	26.59	130.00	-1.12	33.35	26.85
55.00	-1.51	33.03	26.60	131.67	-1.09	33.42	26.90
56.67	-1.49	33.04	26.60	133.34	-1.05	33.46	26.93
58.33	-1.37	33.05	26.61	135.00	-1.03	33.49	26.95
60.00	-1.34	33.06	26.62	136.67	-1.02	33.50	26.96
61.67	-1.33	33.07	26.63	138.34	-1.01	33.51	26.97
63.33	-1.33	33.08	26.63	140.00	-1.01	33.52	26.98
65.00	-1.35	33.08	26.63	141.67	-1.00	33.52	26.98
66.67	-1.38	33.08	26.64	143.34	-0.99	33.53	26.99
68.33	-1.40	33.09	26.64	145.00	-0.98	33.55	27.00
70.00	-1.45	33.10	26.65	146.67	-0.97	33.56	27.01
71.67	-1.55	33.11	26.66	148.34	-0.95	33.57	27.02
73.33	-1.59	33.11	26.66	150.00	-0.93	33.58	27.03
75.00	-1.54	33.11	26.67	151.67	-0.91	33.60	27.04

REFERENCE NO. 73-473- 4 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 17.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.73	31.77	0	25.58	241.8	0.0	0.0	1437.
1	-1.73	31.77	1	25.58	241.9	0.02	0.00	1437.
3	-1.73	31.77	3	25.58	241.8	0.07	0.00	1437.
5	-1.73	31.77	5	25.58	241.9	0.12	0.00	1437.
7	-1.73	31.77	7	25.58	242.0	0.17	0.01	1437.
10	-1.73	31.76	10	25.58	242.1	0.24	0.01	1437.
15	-1.73	31.79	15	25.59	240.3	0.36	0.03	1437.
20	-1.74	31.94	20	25.72	228.6	0.48	0.05	1437.
30	-1.70	32.42	30	26.11	191.4	0.70	0.10	1438.
50	-1.52	33.00	50	26.57	146.9	1.02	0.23	1440.
75	-1.54	33.11	74	26.67	138.1	1.37	0.46	1441.
100	-1.62	33.16	99	26.70	134.5	1.71	0.76	1441.
125	-1.22	33.26	124	26.77	127.9	2.04	1.14	1443.
150	-0.93	33.58	149	27.03	103.8	2.32	1.53	1445.

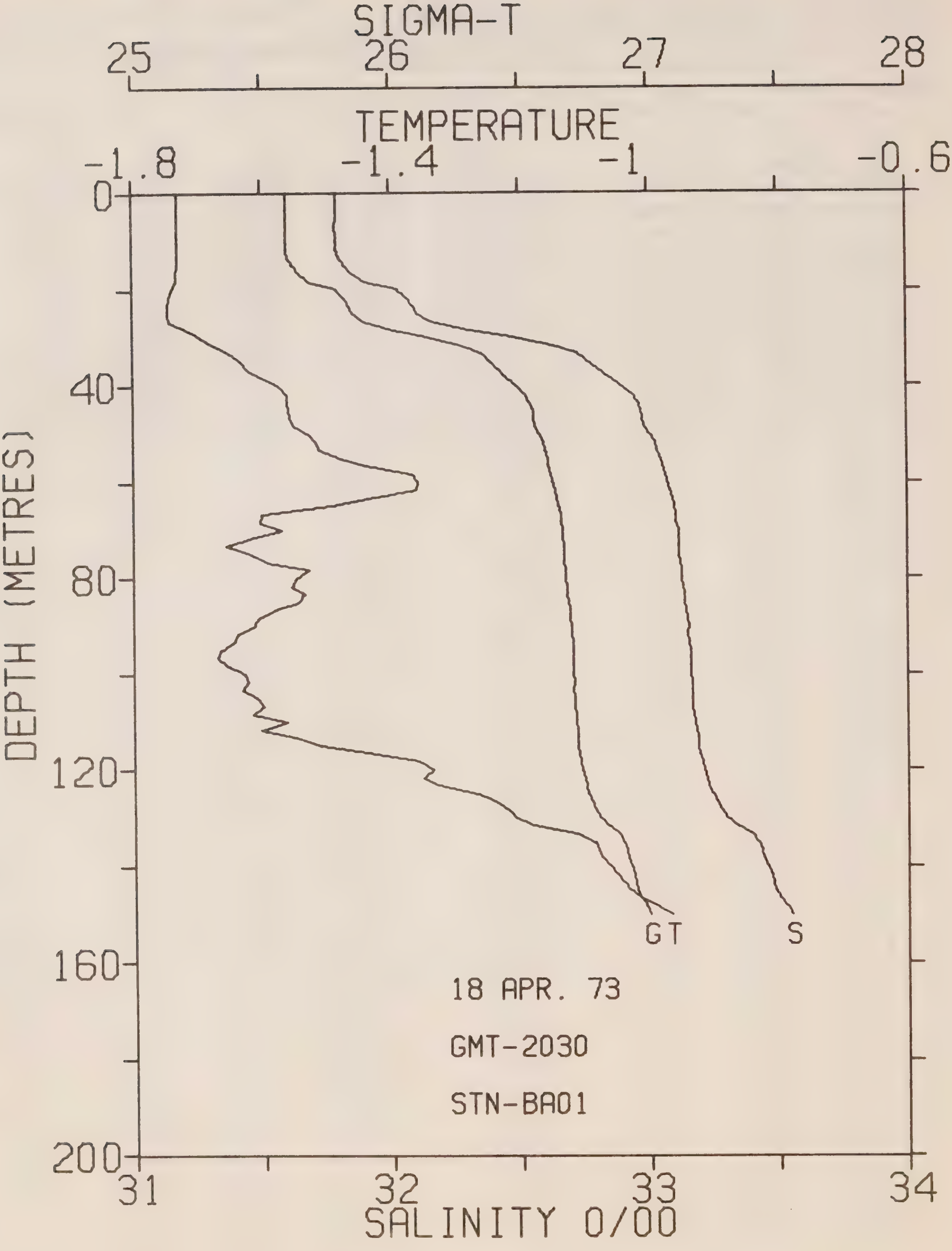

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
GT
S
18 APR. 73
GMT-1900
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 5 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 19.0
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.79	25.59	76.67	-1.65	33.14	26.69
1.67	-1.74	31.79	25.59	78.33	-1.63	33.14	26.69
3.33	-1.74	31.79	25.59	80.00	-1.57	33.14	26.69
5.00	-1.74	31.79	25.60	81.67	-1.54	33.15	26.69
6.67	-1.74	31.79	25.59	83.33	-1.53	33.15	26.69
8.33	-1.74	31.79	25.60	85.00	-1.58	33.16	26.70
10.00	-1.74	31.79	25.60	86.67	-1.57	33.16	26.70
11.67	-1.74	31.79	25.60	88.33	-1.60	33.16	26.71
13.33	-1.74	31.82	25.62	90.00	-1.61	33.17	26.71
15.00	-1.75	31.86	25.65	91.67	-1.64	33.17	26.71
16.67	-1.75	31.88	25.67	93.33	-1.66	33.17	26.71
18.33	-1.75	31.88	25.67	95.00	-1.66	33.17	26.72
20.00	-1.75	31.92	25.70	96.67	-1.66	33.17	26.71
21.67	-1.75	31.98	25.75	98.33	-1.66	33.18	26.72
23.33	-1.75	32.01	25.77	100.00	-1.66	33.18	26.72
25.00	-1.75	32.01	25.78	101.67	-1.66	33.18	26.72
26.67	-1.74	32.06	25.82	103.33	-1.63	33.19	26.73
28.33	-1.73	32.13	25.87	105.00	-1.68	33.19	26.73
30.00	-1.72	32.27	25.98	106.67	-1.64	33.19	26.73
31.67	-1.70	32.47	26.15	108.33	-1.62	33.19	26.73
33.33	-1.69	32.58	26.23	110.00	-1.63	33.20	26.73
35.00	-1.67	32.68	26.31	111.67	-1.61	33.20	26.74
36.67	-1.65	32.77	26.39	113.33	-1.61	33.21	26.74
38.33	-1.60	32.86	26.46	115.00	-1.51	33.21	26.75
40.00	-1.57	32.91	26.50	116.67	-1.52	33.22	26.75
41.67	-1.55	32.96	26.54	118.33	-1.47	33.22	26.75
43.33	-1.56	32.99	26.57	120.00	-1.41	33.23	26.75
45.00	-1.55	33.01	26.58	121.67	-1.36	33.24	26.76
46.67	-1.53	33.02	26.59	123.33	-1.34	33.25	26.77
48.33	-1.53	33.04	26.60	125.00	-1.28	33.26	26.77
50.00	-1.52	33.05	26.61	126.67	-1.23	33.29	26.80
51.67	-1.51	33.06	26.62	128.34	-1.22	33.29	26.80
53.33	-1.49	33.07	26.63	130.00	-1.21	33.33	26.83
55.00	-1.40	33.08	26.63	131.67	-1.12	33.37	26.86
56.67	-1.38	33.08	26.63	133.34	-1.09	33.45	26.93
58.33	-1.34	33.09	26.64	135.00	-1.07	33.48	26.95
60.00	-1.34	33.10	26.65	136.67	-1.06	33.49	26.96
61.67	-1.37	33.11	26.65	138.34	-1.05	33.49	26.96
63.33	-1.46	33.12	26.67	140.00	-1.04	33.51	26.97
65.00	-1.51	33.12	26.67	141.67	-1.04	33.51	26.97
66.67	-1.56	33.13	26.68	143.34	-1.04	33.52	26.98
68.33	-1.60	33.13	26.68	145.00	-1.02	33.53	26.99
70.00	-1.60	33.13	26.68	146.67	-1.01	33.54	27.00
71.67	-1.62	33.14	26.68	148.34	-0.99	33.56	27.01
73.33	-1.61	33.13	26.68	150.00	-0.97	33.58	27.03
75.00	-1.60	33.14	26.69				

REFERENCE NO. 73-473- 5 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 19.0
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.79	0	25.59	240.4	0.0	0.0	1437.
1	-1.74	31.79	1	25.59	240.5	0.02	0.00	1437.
3	-1.74	31.79	3	25.59	240.5	0.07	0.00	1437.
5	-1.74	31.79	5	25.60	240.3	0.12	0.00	1437.
7	-1.74	31.79	7	25.59	240.2	0.17	0.01	1437.
10	-1.74	31.79	10	25.60	240.2	0.24	0.01	1437.
15	-1.75	31.86	15	25.65	235.0	0.36	0.03	1437.
20	-1.75	31.92	20	25.70	229.9	0.48	0.05	1437.
30	-1.72	32.27	30	25.98	203.2	0.70	0.10	1438.
50	-1.52	33.05	50	26.61	143.5	1.02	0.23	1440.
75	-1.60	33.14	74	26.69	136.2	1.36	0.45	1440.
100	-1.66	33.18	99	26.72	132.4	1.70	0.75	1441.
125	-1.28	33.26	124	26.77	127.7	2.03	1.13	1443.

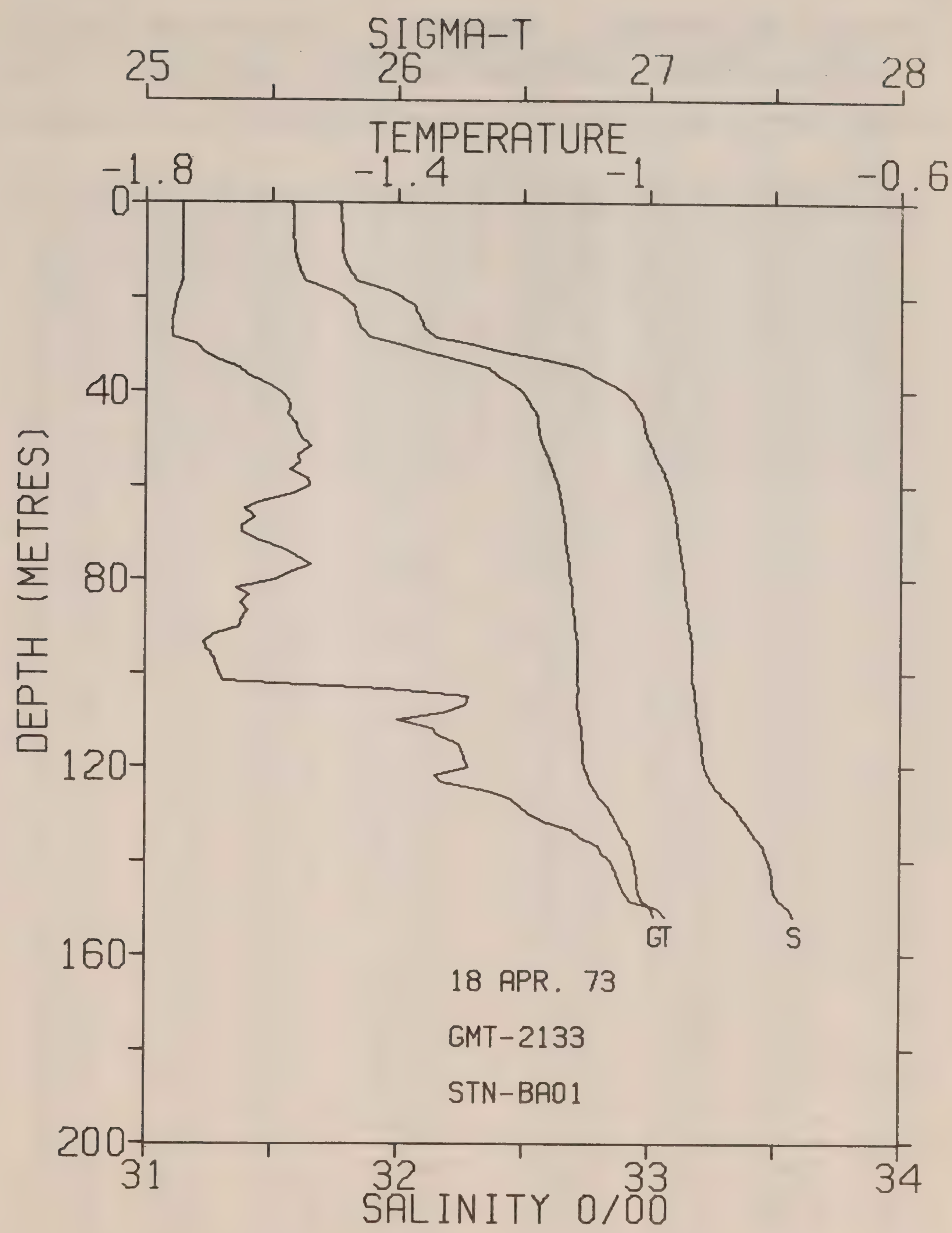

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
GT
S
18 APR. 73
GMT-2030
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 6 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 20.5
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.73	31.80	25.60	76.67	-1.59	33.12	26.67
1.67	-1.73	31.79	25.60	78.33	-1.53	33.13	26.68
3.33	-1.73	31.79	25.60	80.00	-1.55	33.13	26.68
5.00	-1.73	31.79	25.60	81.67	-1.55	33.14	26.68
6.67	-1.73	31.79	25.60	83.33	-1.53	33.14	26.68
8.33	-1.73	31.79	25.60	85.00	-1.54	33.14	26.69
10.00	-1.73	31.79	25.60	86.67	-1.58	33.15	26.69
11.67	-1.73	31.79	25.60	88.33	-1.60	33.15	26.69
13.33	-1.73	31.80	25.61	90.00	-1.61	33.15	26.70
15.00	-1.73	31.83	25.63	91.67	-1.64	33.15	26.70
16.67	-1.73	31.86	25.65	93.33	-1.64	33.16	26.70
18.33	-1.73	31.90	25.69	95.00	-1.66	33.16	26.71
20.00	-1.74	32.03	25.79	96.67	-1.67	33.16	26.70
21.67	-1.74	32.07	25.82	98.33	-1.65	33.16	26.71
23.33	-1.74	32.10	25.84	100.00	-1.63	33.16	26.71
25.00	-1.74	32.11	25.85	101.67	-1.62	33.17	26.71
26.67	-1.74	32.16	25.90	103.33	-1.63	33.16	26.71
28.33	-1.71	32.31	26.02	105.00	-1.61	33.17	26.71
30.00	-1.69	32.48	26.15	106.67	-1.60	33.17	26.71
31.67	-1.67	32.64	26.28	108.33	-1.62	33.17	26.72
33.33	-1.65	32.73	26.35	110.00	-1.56	33.18	26.72
35.00	-1.63	32.77	26.39	111.67	-1.60	33.18	26.72
36.67	-1.62	32.81	26.42	113.33	-1.55	33.19	26.72
38.33	-1.60	32.85	26.45	115.00	-1.51	33.19	26.72
40.00	-1.57	32.90	26.49	116.67	-1.42	33.20	26.73
41.67	-1.56	32.94	26.52	118.33	-1.36	33.20	26.73
43.33	-1.56	32.96	26.54	120.00	-1.34	33.21	26.74
45.00	-1.56	32.97	26.55	121.67	-1.35	33.22	26.75
46.67	-1.55	32.98	26.55	123.33	-1.33	33.23	26.75
48.33	-1.55	32.99	26.56	125.00	-1.27	33.24	26.76
50.00	-1.53	33.00	26.58	126.67	-1.24	33.26	26.78
51.67	-1.52	33.03	26.59	128.34	-1.22	33.28	26.79
53.33	-1.51	33.04	26.60	130.00	-1.21	33.30	26.81
55.00	-1.48	33.05	26.61	131.67	-1.18	33.34	26.84
56.67	-1.44	33.05	26.61	133.34	-1.11	33.40	26.88
58.33	-1.37	33.06	26.62	135.00	-1.09	33.42	26.90
60.00	-1.36	33.07	26.63	136.67	-1.08	33.43	26.91
61.67	-1.36	33.08	26.64	138.34	-1.07	33.44	26.92
63.33	-1.43	33.09	26.65	140.00	-1.06	33.45	26.93
65.00	-1.49	33.10	26.65	141.67	-1.05	33.47	26.94
66.67	-1.60	33.10	26.66	143.34	-1.04	33.48	26.94
68.33	-1.60	33.11	26.66	145.00	-1.03	33.48	26.95
70.00	-1.57	33.11	26.67	146.67	-1.01	33.50	26.97
71.67	-1.62	33.12	26.67	148.34	-0.99	33.53	26.99
73.33	-1.66	33.12	26.67	150.00	-0.97	33.55	27.00
75.00	-1.62	33.12	26.67				

REFERENCE NO. 73-473- 6 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 20.5
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.73	31.80	0	25.60	239.6	0.0	0.0	1437.
1	-1.73	31.79	1	25.60	239.8	0.02	0.00	1437.
3	-1.73	31.79	3	25.60	239.9	0.07	0.00	1437.
5	-1.73	31.79	5	25.60	240.0	0.12	0.00	1437.
7	-1.73	31.79	7	25.60	240.0	0.17	0.01	1437.
10	-1.73	31.79	10	25.60	239.9	0.24	0.01	1437.
15	-1.73	31.83	15	25.63	236.9	0.36	0.03	1437.
20	-1.74	32.03	20	25.79	221.4	0.48	0.05	1437.
30	-1.69	32.48	30	26.15	187.2	0.69	0.10	1438.
50	-1.53	33.00	50	26.58	146.8	1.00	0.23	1440.
75	-1.62	33.12	74	26.67	137.7	1.35	0.45	1440.
100	-1.63	33.16	99	26.71	134.0	1.69	0.75	1441.
125	-1.27	33.24	124	26.76	128.7	2.02	1.13	1443.


SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
GT
S
18 APR. 73
GMT-2133
STN-BA01
31
32
33
34
SALINITY 0/00

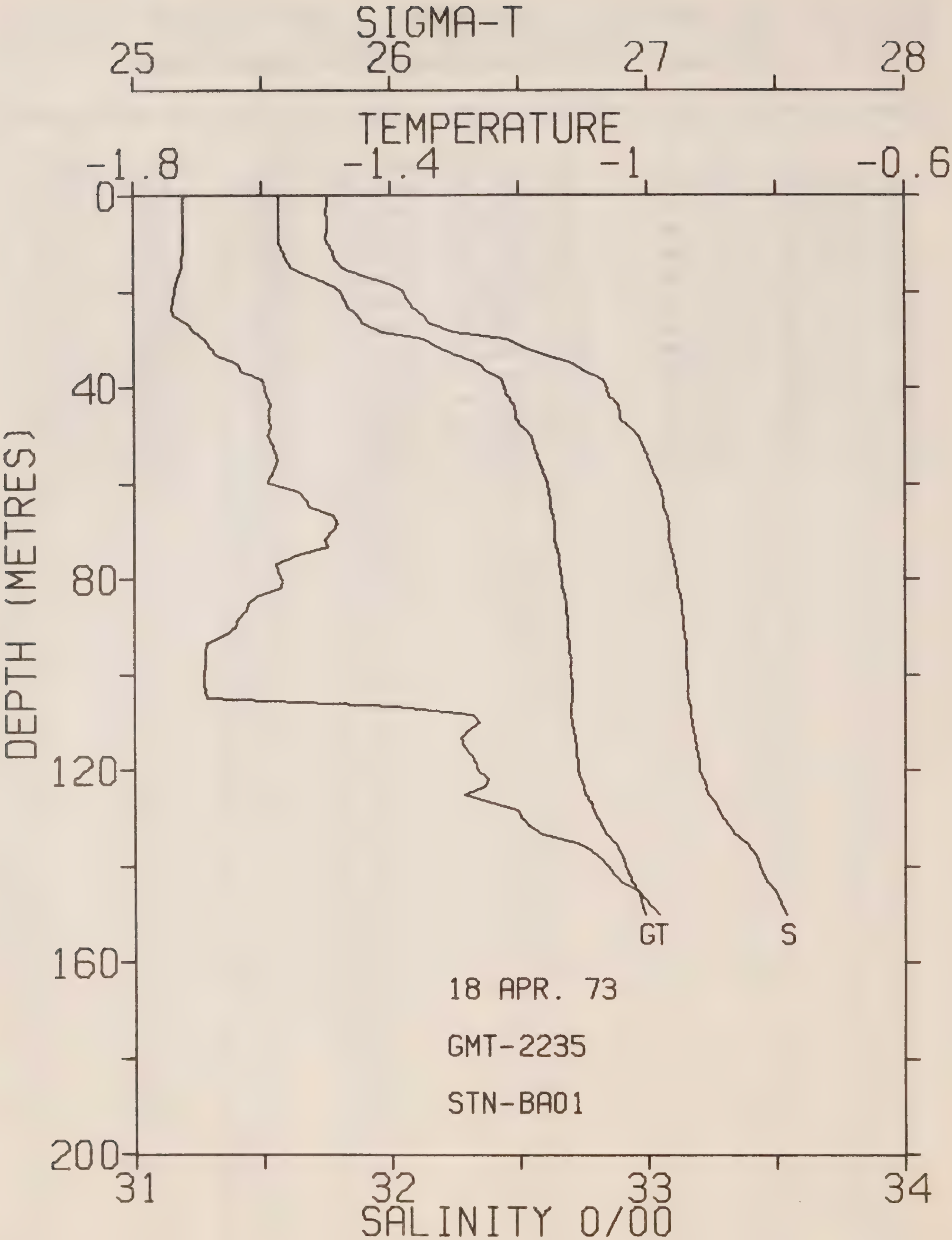
REFERENCE NO. 73-473- 7 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 21.5
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAI	SIGMA T
0.0	-1.74	31.77	25.58
1.67	-1.74	31.77	25.58
3.33	-1.74	31.77	25.58
5.00	-1.74	31.78	25.59
6.67	-1.74	31.78	25.58
8.33	-1.74	31.78	25.59
10.00	-1.74	31.78	25.59
11.67	-1.74	31.78	25.59
13.33	-1.74	31.80	25.61
15.00	-1.74	31.81	25.62
16.67	-1.74	31.84	25.64
18.33	-1.75	31.95	25.73
20.00	-1.75	32.02	25.78
21.67	-1.75	32.07	25.82
23.33	-1.76	32.08	25.83
25.00	-1.76	32.09	25.84
26.67	-1.76	32.11	25.85
28.33	-1.76	32.15	25.89
30.00	-1.72	32.29	26.01
31.67	-1.71	32.43	26.12
33.33	-1.69	32.59	26.24
35.00	-1.65	32.73	26.36
36.67	-1.63	32.78	26.40
38.33	-1.61	32.84	26.45
40.00	-1.59	32.90	26.49
41.67	-1.57	32.93	26.52
43.33	-1.57	32.95	26.53
45.00	-1.57	32.97	26.55
46.67	-1.56	32.98	26.56
48.33	-1.56	32.99	26.56
50.00	-1.55	32.99	26.57
51.67	-1.54	33.01	26.58
53.33	-1.56	33.02	26.59
55.00	-1.55	33.04	26.60
56.67	-1.57	33.05	26.62
58.33	-1.54	33.06	26.63
60.00	-1.54	33.08	26.64
61.67	-1.56	33.09	26.65
63.33	-1.62	33.10	26.65
65.00	-1.64	33.10	26.66
66.67	-1.63	33.11	26.66
68.33	-1.65	33.11	26.67
70.00	-1.65	33.11	26.67
71.67	-1.62	33.12	26.67
73.33	-1.59	33.12	26.67
75.00	-1.56	33.13	26.68

PRESS	TEMP	SAL	SIGMA T
76.67	-1.54	33.14	26.68
78.33	-1.57	33.14	26.69
80.00	-1.60	33.14	26.69
81.67	-1.65	33.15	26.69
83.33	-1.63	33.14	26.69
85.00	-1.65	33.15	26.70
86.67	-1.64	33.16	26.70
88.33	-1.65	33.16	26.70
90.00	-1.65	33.16	26.70
91.67	-1.69	33.17	26.71
93.33	-1.71	33.17	26.71
95.00	-1.70	33.17	26.72
96.67	-1.69	33.17	26.72
98.33	-1.69	33.17	26.72
100.00	-1.68	33.17	26.72
101.67	-1.68	33.17	26.72
103.33	-1.42	33.19	26.72
105.00	-1.29	33.18	26.71
106.67	-1.29	33.19	26.72
108.33	-1.33	33.19	26.72
110.00	-1.40	33.19	26.73
111.67	-1.34	33.20	26.73
113.33	-1.33	33.21	26.74
115.00	-1.30	33.21	26.74
116.67	-1.30	33.21	26.74
118.33	-1.29	33.22	26.74
120.00	-1.29	33.22	26.75
121.67	-1.34	33.24	26.76
123.33	-1.33	33.25	26.77
125.00	-1.26	33.28	26.79
126.67	-1.22	33.30	26.81
128.34	-1.20	33.34	26.84
130.00	-1.19	33.36	26.85
131.67	-1.17	33.39	26.87
133.34	-1.12	33.41	26.89
135.00	-1.11	33.43	26.91
136.67	-1.08	33.46	26.93
138.34	-1.07	33.46	26.94
140.00	-1.06	33.48	26.95
141.67	-1.05	33.49	26.95
143.34	-1.05	33.49	26.96
145.00	-1.04	33.49	26.96
146.67	-1.04	33.50	26.96
148.34	-1.03	33.52	26.98
150.00	-0.99	33.56	27.01
151.67	-0.97	33.58	27.02

REFERENCE NO. 73-473- 7 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 21.5
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.77	0	25.58	241.5	0.0	0.0	1437.
1	-1.74	31.77	1	25.58	241.5	0.02	0.00	1437.
3	-1.74	31.77	3	25.58	241.4	0.07	0.00	1437.
5	-1.74	31.78	5	25.59	241.2	0.12	0.00	1437.
7	-1.74	31.78	7	25.58	241.2	0.17	0.01	1437.
10	-1.74	31.78	10	25.59	240.9	0.24	0.01	1437.
15	-1.74	31.81	15	25.62	238.2	0.36	0.03	1437.
20	-1.75	32.02	20	25.78	222.3	0.48	0.05	1437.
30	-1.72	32.29	30	26.01	201.1	0.69	0.10	1438.
50	-1.55	32.99	50	26.57	147.5	1.01	0.23	1440.
75	-1.56	33.13	74	26.68	136.9	1.37	0.46	1441.
100	-1.68	33.17	99	26.72	133.1	1.70	0.76	1441.
125	-1.26	33.28	124	26.79	126.1	2.03	1.13	1443.
150	-0.99	33.56	149	27.01	105.4	2.32	1.53	1445.



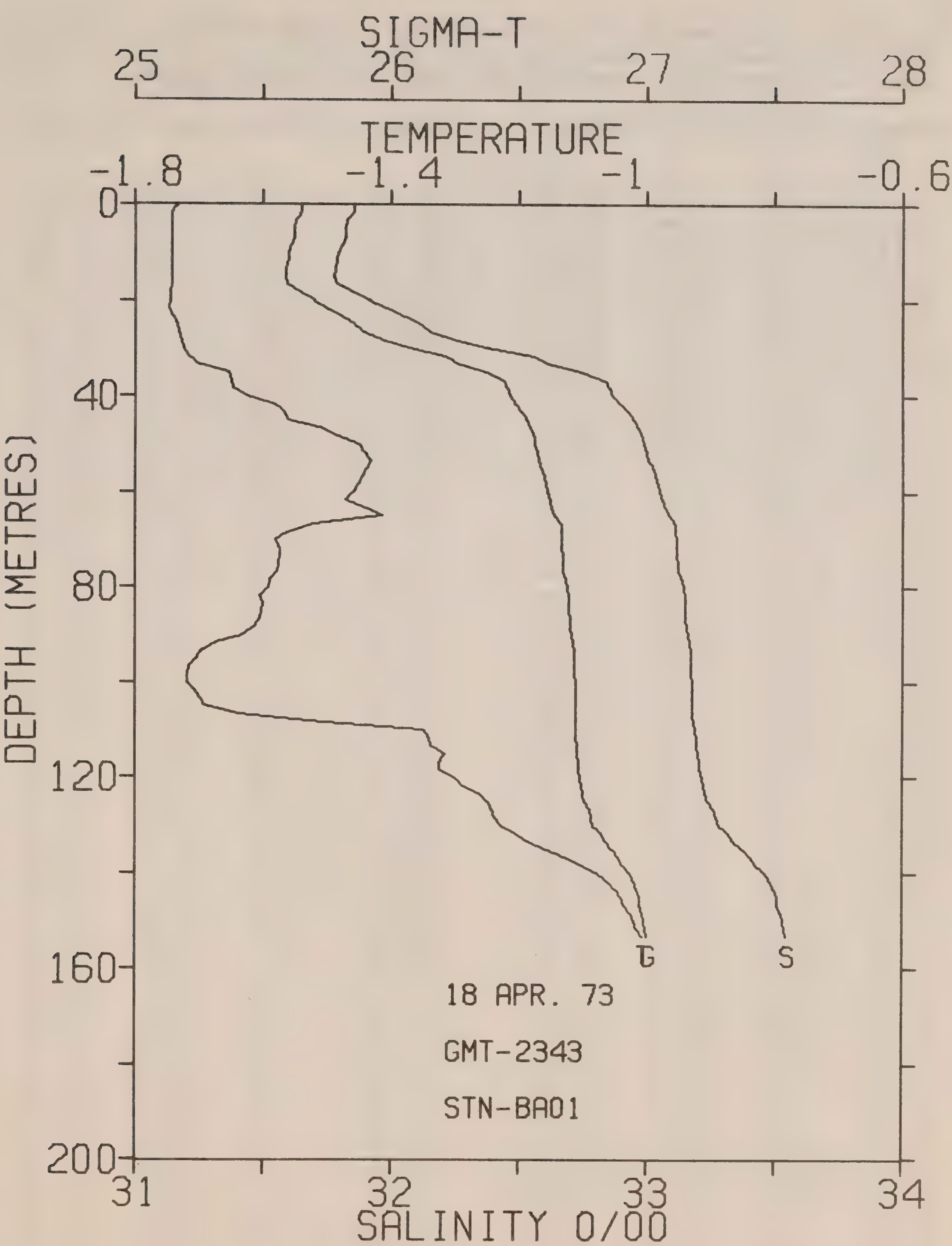
SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
GT
S
18 APR. 73
GMT-2235
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 8 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 22.6
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.72	31.75	25.57	76.67	-1.58	33.10	26.66
1.67	-1.72	31.75	25.57	78.33	-1.58	33.11	26.66
3.33	-1.72	31.75	25.57	80.00	-1.57	33.11	26.67
5.00	-1.72	31.75	25.57	81.67	-1.57	33.12	26.67
6.67	-1.72	31.75	25.57	83.33	-1.60	33.13	26.68
8.33	-1.72	31.75	25.57	85.00	-1.62	33.13	26.68
10.00	-1.72	31.75	25.57	86.67	-1.63	33.13	26.68
11.67	-1.72	31.78	25.58	88.33	-1.64	33.14	26.69
13.33	-1.72	31.78	25.59	90.00	-1.64	33.14	26.69
15.00	-1.73	31.81	25.62	91.67	-1.66	33.14	26.69
16.67	-1.73	31.89	25.68	93.33	-1.69	33.15	26.70
18.33	-1.73	32.00	25.76	95.00	-1.69	33.15	26.70
20.00	-1.74	32.05	25.81	96.67	-1.69	33.15	26.70
21.67	-1.74	32.07	25.82	98.33	-1.69	33.15	26.70
23.33	-1.74	32.09	25.84	100.00	-1.69	33.15	26.70
25.00	-1.74	32.13	25.87	101.67	-1.69	33.16	26.70
26.67	-1.72	32.16	25.89	103.33	-1.69	33.16	26.70
28.33	-1.71	32.25	25.97	105.00	-1.69	33.16	26.70
30.00	-1.69	32.46	26.14	106.67	-1.39	33.16	26.70
31.67	-1.68	32.52	26.19	108.33	-1.27	33.17	26.70
33.33	-1.67	32.61	26.26	110.00	-1.26	33.17	26.70
35.00	-1.64	32.71	26.34	111.67	-1.28	33.18	26.71
36.67	-1.63	32.76	26.38	113.33	-1.29	33.18	26.72
38.33	-1.60	32.83	26.43	115.00	-1.29	33.19	26.72
40.00	-1.60	32.84	26.45	116.67	-1.28	33.20	26.72
41.67	-1.59	32.85	26.45	118.33	-1.27	33.20	26.73
43.33	-1.59	32.88	26.48	120.00	-1.27	33.20	26.73
45.00	-1.59	32.89	26.49	121.67	-1.25	33.22	26.74
46.67	-1.59	32.90	26.49	123.33	-1.25	33.23	26.75
48.33	-1.59	32.93	26.52	125.00	-1.29	33.23	26.75
50.00	-1.59	32.97	26.55	126.67	-1.25	33.26	26.78
51.67	-1.59	32.98	26.56	128.34	-1.20	33.28	26.79
53.33	-1.58	32.99	26.57	130.00	-1.20	33.30	26.80
55.00	-1.57	33.01	26.58	131.67	-1.18	33.32	26.82
56.67	-1.58	33.02	26.59	133.34	-1.16	33.34	26.84
58.33	-1.59	33.03	26.60	135.00	-1.11	33.39	26.87
60.00	-1.59	33.04	26.61	136.67	-1.09	33.41	26.89
61.67	-1.54	33.06	26.62	138.34	-1.07	33.43	26.90
63.33	-1.53	33.06	26.62	140.00	-1.06	33.43	26.91
65.00	-1.53	33.06	26.62	141.67	-1.05	33.45	26.93
66.67	-1.49	33.08	26.64	143.34	-1.04	33.47	26.94
68.33	-1.48	33.08	26.64	145.00	-1.02	33.50	26.96
70.00	-1.49	33.09	26.64	146.67	-1.00	33.51	26.97
71.67	-1.50	33.08	26.64	148.34	-0.99	33.52	26.98
73.33	-1.50	33.09	26.64	150.00	-0.98	33.54	26.99
75.00	-1.55	33.10	26.66				

REFERENCE NO. 73-473- 8 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 22.6
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.72	31.75	0	25.57	242.7	0.0	0.0	1437.
1	-1.72	31.75	1	25.57	243.0	0.02	0.00	1437.
3	-1.72	31.75	3	25.57	243.1	0.07	0.00	1437.
5	-1.72	31.75	5	25.57	242.9	0.12	0.00	1437.
7	-1.72	31.75	7	25.57	243.0	0.17	0.01	1437.
10	-1.72	31.75	10	25.57	242.8	0.24	0.01	1437.
15	-1.73	31.81	15	25.62	238.2	0.36	0.03	1437.
20	-1.74	32.05	20	25.81	220.1	0.48	0.05	1437.
30	-1.69	32.46	30	26.14	188.7	0.69	0.10	1438.
50	-1.59	32.97	50	26.55	149.3	1.02	0.23	1440.
75	-1.55	33.10	74	26.66	139.0	1.37	0.46	1441.
100	-1.69	33.15	99	26.70	134.5	1.72	0.76	1440.
125	-1.29	33.23	124	26.75	129.6	2.05	1.14	1443.

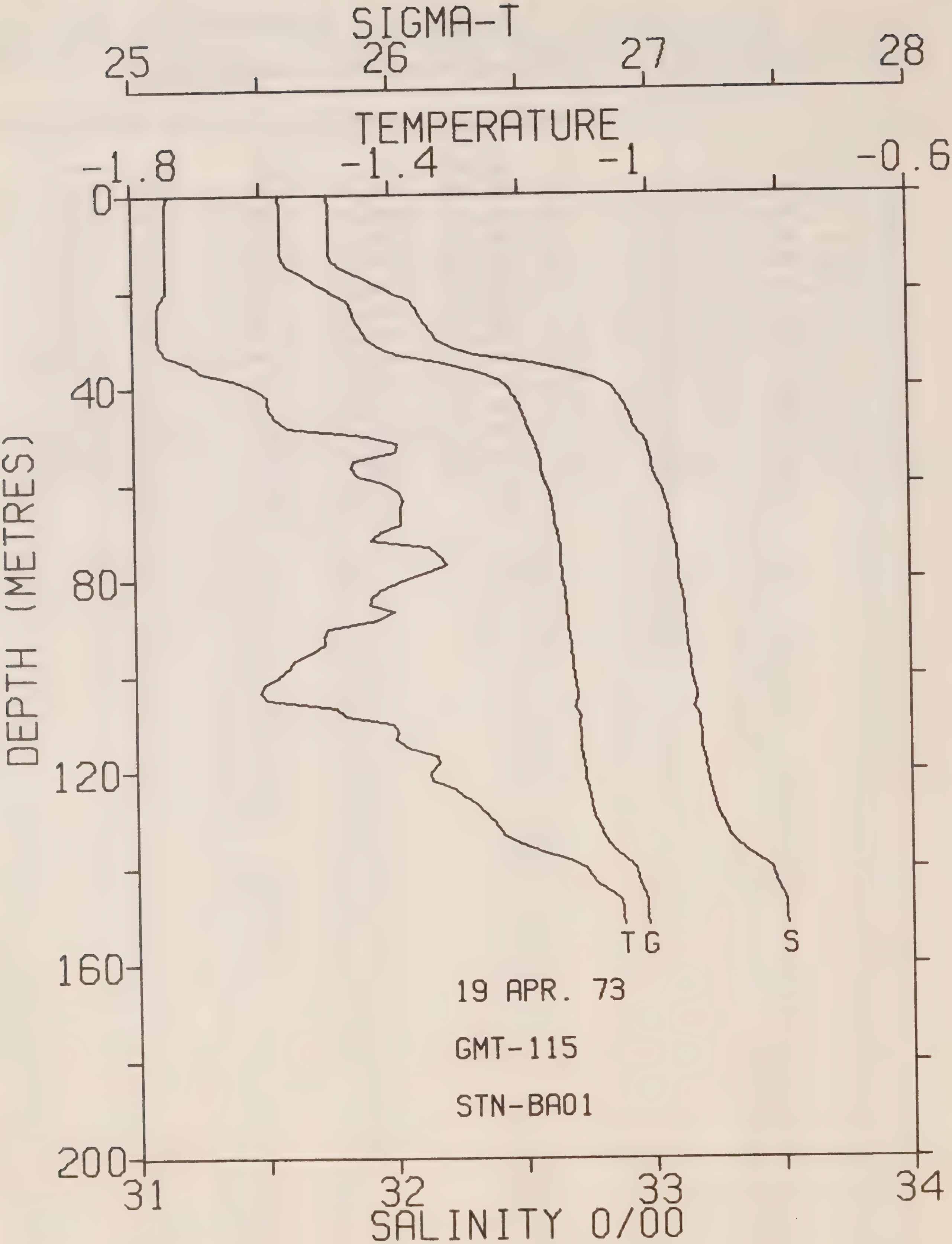

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T
G
S
18 APR. 73
GMT-2343
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 9 STN- BA01 DATE 18/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 23.7
RESULTS OF STD CAST 93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.73	31.86	25.65	78.33	-1.59	33.14	26.69
1.67	-1.74	31.86	25.65	80.00	-1.59	33.14	26.69
3.33	-1.74	31.83	25.63	81.67	-1.61	33.15	26.69
5.00	-1.74	31.82	25.62	83.33	-1.60	33.15	26.70
6.67	-1.74	31.82	25.62	85.00	-1.60	33.15	26.70
8.33	-1.74	31.81	25.61	86.67	-1.61	33.15	26.70
10.00	-1.74	31.80	25.60	88.33	-1.61	33.16	26.70
11.67	-1.74	31.79	25.60	90.00	-1.63	33.16	26.71
13.33	-1.74	31.78	25.59	91.67	-1.67	33.17	26.71
15.00	-1.74	31.78	25.59	93.33	-1.70	33.17	26.71
16.67	-1.74	31.79	25.60	95.00	-1.71	33.17	26.72
18.33	-1.74	31.85	25.65	96.67	-1.72	33.17	26.72
20.00	-1.74	31.92	25.70	98.33	-1.72	33.17	26.72
21.67	-1.75	31.98	25.75	100.00	-1.72	33.18	26.72
23.33	-1.74	32.06	25.81	101.67	-1.71	33.18	26.72
25.00	-1.73	32.11	25.86	103.33	-1.70	33.18	26.72
26.67	-1.73	32.16	25.89	105.00	-1.69	33.18	26.72
28.33	-1.73	32.26	25.98	106.67	-1.64	33.18	26.72
30.00	-1.73	32.38	26.07	108.33	-1.50	33.18	26.72
31.67	-1.72	32.56	26.22	110.00	-1.35	33.19	26.72
33.33	-1.70	32.61	26.26	111.67	-1.34	33.19	26.72
35.00	-1.65	32.75	26.37	113.33	-1.34	33.19	26.73
36.67	-1.65	32.83	26.44	115.00	-1.32	33.20	26.73
38.33	-1.65	32.86	26.46	116.67	-1.32	33.21	26.73
40.00	-1.63	32.86	26.46	118.33	-1.32	33.21	26.73
41.67	-1.58	32.90	26.49	120.00	-1.30	33.22	26.74
43.33	-1.57	32.93	26.51	121.67	-1.29	33.22	26.74
45.00	-1.56	32.95	26.53	123.33	-1.26	33.23	26.75
46.67	-1.51	32.97	26.55	125.00	-1.25	33.24	26.76
48.33	-1.48	32.99	26.56	126.67	-1.24	33.26	26.78
50.00	-1.45	32.99	26.56	128.34	-1.24	33.27	26.79
51.67	-1.44	33.00	26.57	130.00	-1.23	33.28	26.79
53.33	-1.43	33.01	26.58	131.67	-1.21	33.32	26.82
55.00	-1.44	33.03	26.59	133.34	-1.19	33.34	26.84
56.67	-1.44	33.03	26.60	135.00	-1.15	33.38	26.87
58.33	-1.45	33.04	26.60	136.67	-1.13	33.40	26.89
60.00	-1.46	33.05	26.61	138.34	-1.10	33.43	26.91
61.67	-1.47	33.06	26.62	140.00	-1.08	33.46	26.93
63.33	-1.44	33.07	26.63	141.67	-1.06	33.48	26.95
65.00	-1.41	33.09	26.64	143.34	-1.05	33.50	26.96
66.67	-1.52	33.11	26.66	145.00	-1.04	33.51	26.97
68.33	-1.56	33.11	26.66	146.67	-1.04	33.51	26.97
70.00	-1.58	33.11	26.67	148.34	-1.02	33.53	26.98
71.67	-1.57	33.12	26.67	150.00	-1.02	33.53	26.99
73.33	-1.57	33.12	26.67	151.67	-1.02	33.54	26.99
75.00	-1.58	33.12	26.67	153.34	-1.01	33.54	27.00
76.67	-1.58	33.12	26.67				

REFERENCE NO, 73-473- 9 STN- BA01 DATE 18/ 4/73
POSITION 74-30,0N, 91-21,0W GMT 23,7
RESULTS OF STD CAST 93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1,73	31,86	0	25,65	234,7	0,0	0,0	1437,
1	-1,74	31,86	1	25,65	235,0	0,02	0,00	1437,
3	-1,74	31,83	3	25,63	236,8	0,07	0,00	1437,
5	-1,74	31,82	5	25,62	237,8	0,12	0,00	1437,
7	-1,74	31,82	7	25,62	237,8	0,17	0,01	1437,
10	-1,74	31,80	10	25,60	239,7	0,24	0,01	1437,
15	-1,74	31,78	15	25,59	240,8	0,36	0,03	1437,
20	-1,74	31,92	20	25,70	230,0	0,48	0,05	1437,
30	-1,73	32,38	30	26,07	194,5	0,69	0,10	1438,
50	-1,45	32,99	50	26,56	148,0	1,01	0,23	1441,
75	-1,58	33,12	74	26,67	137,5	1,37	0,46	1441,
100	-1,72	33,18	99	26,72	132,8	1,70	0,76	1440,
125	-1,25	33,24	124	26,76	129,2	2,03	1,13	1443,
150	-1,02	33,53	149	26,99	107,1	2,32	1,54	1445,

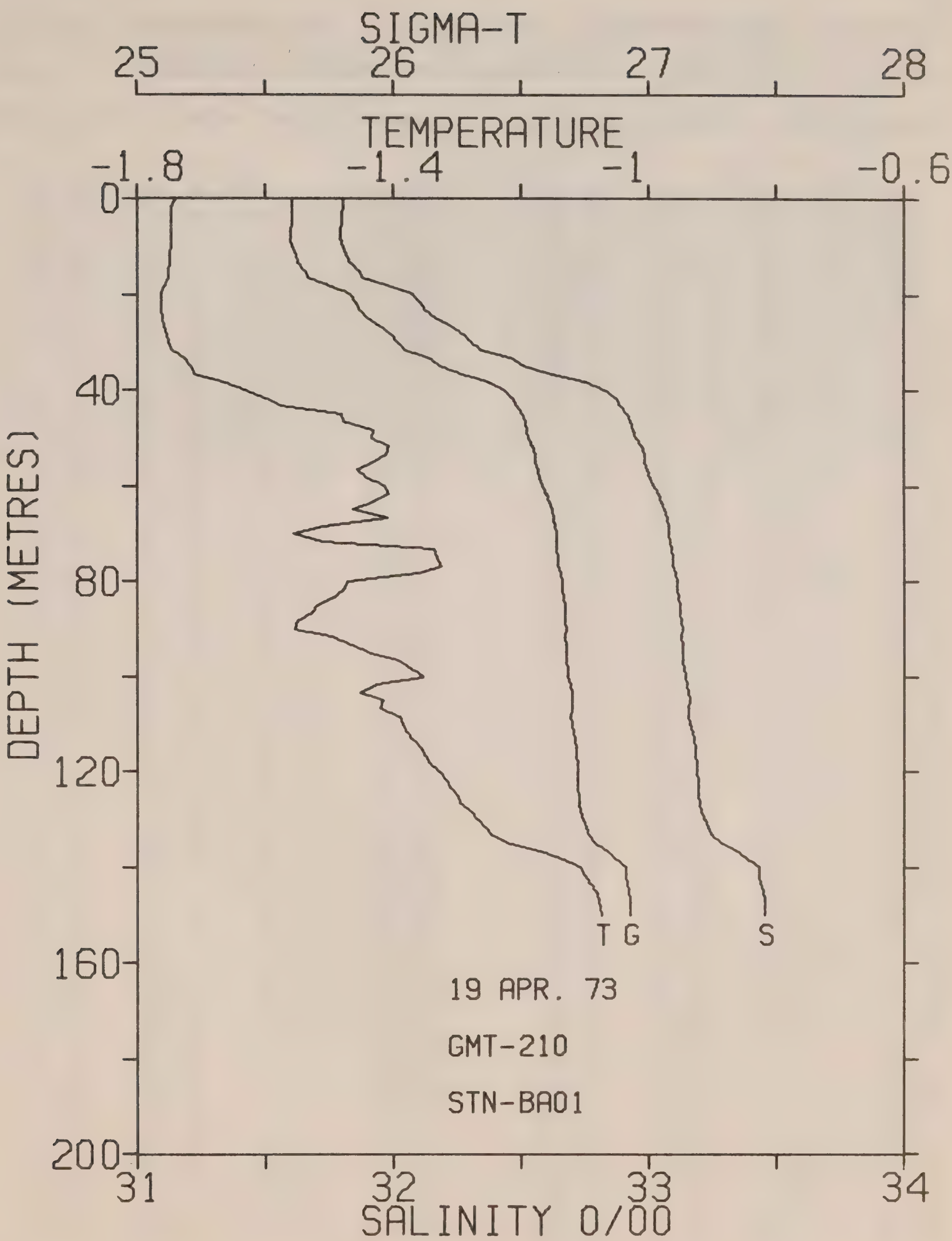

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G
S
19 APR. 73
GMT-115
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 10   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 1.3
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.76	25.57	76.67	-1.32	33.10	26.65
1.67	-1.75	31.77	25.58	78.33	-1.34	33.11	26.65
3.33	-1.75	31.77	25.58	80.00	-1.39	33.11	26.66
5.00	-1.75	31.77	25.58	81.67	-1.42	33.12	26.66
6.67	-1.75	31.77	25.58	83.33	-1.43	33.12	26.67
8.33	-1.75	31.76	25.58	85.00	-1.43	33.13	26.67
10.00	-1.75	31.77	25.58	86.67	-1.40	33.13	26.67
11.67	-1.75	31.77	25.58	88.33	-1.42	33.13	26.68
13.33	-1.75	31.77	25.58	90.00	-1.50	33.13	26.68
15.00	-1.75	31.81	25.61	91.67	-1.51	33.14	26.68
16.67	-1.75	31.87	25.66	93.33	-1.51	33.14	26.69
18.33	-1.75	31.94	25.72	95.00	-1.53	33.14	26.69
20.00	-1.75	32.00	25.76	96.67	-1.55	33.15	26.69
21.67	-1.75	32.07	25.83	98.33	-1.56	33.15	26.70
23.33	-1.76	32.10	25.85	100.00	-1.58	33.15	26.70
25.00	-1.76	32.11	25.86	101.67	-1.60	33.16	26.71
26.67	-1.76	32.13	25.87	103.33	-1.61	33.17	26.71
28.33	-1.76	32.16	25.90	105.00	-1.60	33.17	26.71
30.00	-1.76	32.18	25.91	106.67	-1.49	33.16	26.70
31.67	-1.75	32.24	25.96	108.33	-1.47	33.19	26.72
33.33	-1.75	32.33	26.03	110.00	-1.40	33.18	26.72
35.00	-1.71	32.55	26.21	111.67	-1.39	33.19	26.72
36.67	-1.69	32.70	26.33	113.33	-1.40	33.19	26.72
38.33	-1.64	32.80	26.41	115.00	-1.38	33.19	26.72
40.00	-1.61	32.85	26.46	116.67	-1.33	33.20	26.73
41.67	-1.59	32.88	26.47	118.33	-1.33	33.20	26.73
43.33	-1.59	32.90	26.49	120.00	-1.34	33.21	26.74
45.00	-1.59	32.91	26.51	121.67	-1.34	33.21	26.74
46.67	-1.58	32.93	26.52	123.33	-1.31	33.22	26.75
48.33	-1.56	32.94	26.53	125.00	-1.29	33.23	26.75
50.00	-1.44	32.97	26.55	126.67	-1.28	33.24	26.76
51.67	-1.39	32.99	26.56	128.34	-1.26	33.25	26.77
53.33	-1.39	33.00	26.57	130.00	-1.25	33.27	26.78
55.00	-1.46	33.01	26.58	131.67	-1.24	33.28	26.79
56.67	-1.46	33.01	26.58	133.34	-1.23	33.29	26.80
58.33	-1.45	33.01	26.58	135.00	-1.20	33.33	26.83
60.00	-1.41	33.03	26.59	136.67	-1.17	33.36	26.86
61.67	-1.39	33.05	26.61	138.34	-1.13	33.41	26.89
63.33	-1.38	33.06	26.62	140.00	-1.11	33.45	26.93
65.00	-1.39	33.07	26.62	141.67	-1.10	33.47	26.94
66.67	-1.39	33.07	26.63	143.34	-1.09	33.48	26.95
68.33	-1.39	33.07	26.63	145.00	-1.07	33.49	26.96
70.00	-1.42	33.08	26.64	146.67	-1.05	33.51	26.97
71.67	-1.43	33.09	26.64	148.34	-1.05	33.51	26.97
73.33	-1.34	33.10	26.65	150.00	-1.05	33.51	26.97
75.00	-1.33	33.10	26.65	151.67	-1.05	33.52	26.98

REFERENCE NO. 73-473- 10   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 1.3
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.76	0	25.57	242.3	0.0	0.0	1437.
1	-1.74	31.76	1	25.57	242.2	0.02	0.00	1437.
3	-1.75	31.77	3	25.58	241.9	0.07	0.00	1437.
5	-1.75	31.77	5	25.58	242.0	0.12	0.00	1437.
7	-1.75	31.77	7	25.58	242.0	0.17	0.01	1437.
10	-1.75	31.77	10	25.58	241.8	0.24	0.01	1437.
15	-1.75	31.81	15	25.61	238.4	0.36	0.03	1437.
20	-1.75	32.00	20	25.76	224.0	0.48	0.05	1437.
30	-1.76	32.18	30	25.91	210.0	0.69	0.10	1438.
50	-1.44	32.97	50	26.55	149.7	1.03	0.24	1441.
75	-1.33	33.10	74	26.65	139.7	1.39	0.47	1442.
100	-1.58	33.15	99	26.70	134.9	1.73	0.77	1441.
125	-1.29	33.23	124	26.75	129.5	2.06	1.15	1443.
150	-1.05	33.51	149	26.97	108.7	2.36	1.56	1445.

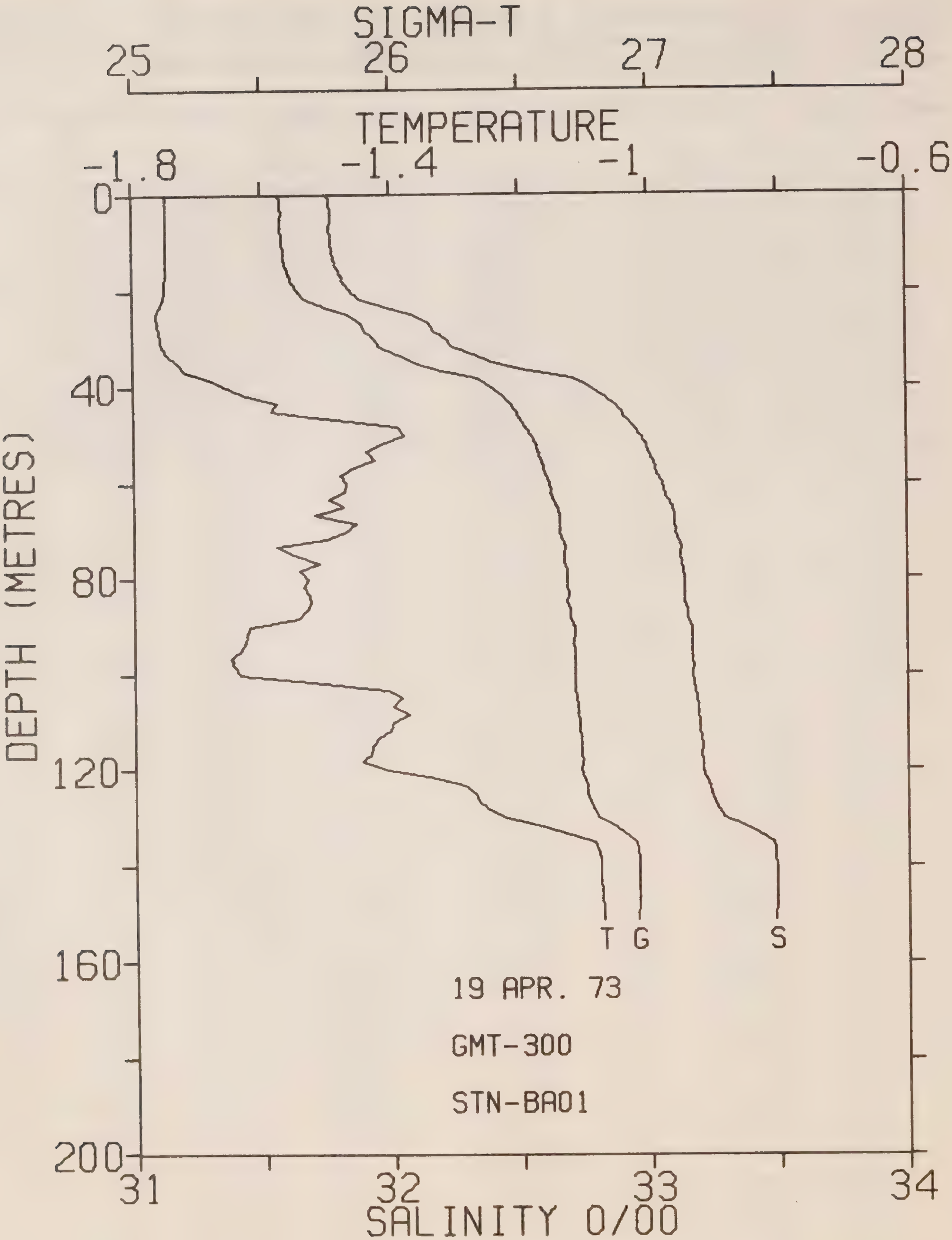

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G
S
19 APR. 73
GMT-210
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 11 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 2.2
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.80	25.61	76.67	-1.32	33.10	26.65
1.67	-1.75	31.80	25.61	78.33	-1.36	33.11	26.65
3.33	-1.75	31.80	25.61	80.00	-1.47	33.11	26.66
5.00	-1.75	31.80	25.61	81.67	-1.48	33.11	26.66
6.67	-1.75	31.80	25.60	83.33	-1.49	33.12	26.67
8.33	-1.75	31.79	25.60	85.00	-1.52	33.12	26.67
10.00	-1.75	31.80	25.61	86.67	-1.53	33.12	26.67
11.67	-1.75	31.82	25.62	88.33	-1.55	33.13	26.67
13.33	-1.75	31.83	25.63	90.00	-1.55	33.13	26.68
15.00	-1.75	31.86	25.66	91.67	-1.50	33.13	26.67
16.67	-1.75	31.88	25.67	93.33	-1.46	33.13	26.68
18.33	-1.76	31.99	25.76	95.00	-1.43	33.13	26.68
20.00	-1.76	32.08	25.83	96.67	-1.39	33.14	26.68
21.67	-1.76	32.11	25.85	98.33	-1.37	33.14	26.68
23.33	-1.76	32.13	25.87	100.00	-1.35	33.14	26.68
25.00	-1.76	32.16	25.90	101.67	-1.43	33.15	26.69
26.67	-1.76	32.23	25.95	103.33	-1.45	33.16	26.70
28.33	-1.75	32.28	25.99	105.00	-1.42	33.16	26.70
30.00	-1.75	32.31	26.02	106.67	-1.42	33.16	26.70
31.67	-1.74	32.35	26.05	108.33	-1.39	33.16	26.70
33.33	-1.73	32.46	26.14	110.00	-1.39	33.16	26.70
35.00	-1.72	32.51	26.18	111.67	-1.38	33.17	26.71
36.67	-1.71	32.62	26.27	113.33	-1.37	33.18	26.71
38.33	-1.67	32.75	26.37	115.00	-1.36	33.18	26.71
40.00	-1.63	32.83	26.43	116.67	-1.35	33.18	26.72
41.67	-1.60	32.87	26.47	118.33	-1.34	33.19	26.72
43.33	-1.58	32.89	26.49	120.00	-1.33	33.19	26.72
45.00	-1.48	32.92	26.51	121.67	-1.31	33.19	26.72
46.67	-1.48	32.93	26.51	123.33	-1.31	33.19	26.72
48.33	-1.43	32.94	26.52	125.00	-1.30	33.20	26.73
50.00	-1.43	32.95	26.53	126.67	-1.30	33.20	26.73
51.67	-1.41	32.97	26.55	128.34	-1.28	33.21	26.73
53.33	-1.41	32.98	26.56	130.00	-1.27	33.22	26.75
55.00	-1.43	32.98	26.56	131.67	-1.26	33.23	26.75
56.67	-1.46	32.99	26.57	133.34	-1.24	33.25	26.77
58.33	-1.44	33.00	26.57	135.00	-1.21	33.29	26.80
60.00	-1.41	33.02	26.59	136.67	-1.17	33.34	26.84
61.67	-1.41	33.04	26.60	138.34	-1.13	33.39	26.87
63.33	-1.43	33.05	26.61	140.00	-1.11	33.43	26.91
65.00	-1.46	33.06	26.62	141.67	-1.10	33.43	26.91
66.67	-1.41	33.07	26.63	143.34	-1.09	33.44	26.92
68.33	-1.51	33.08	26.63	145.00	-1.08	33.45	26.92
70.00	-1.55	33.08	26.64	146.67	-1.08	33.46	26.93
71.67	-1.51	33.08	26.64	148.34	-1.08	33.46	26.93
73.33	-1.34	33.09	26.64	150.00	-1.07	33.46	26.93
75.00	-1.33	33.09	26.64				

REFERENCE NO. 73-473- 11   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 2.2
RESULTS OF STD CAST   91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.80	0	25.61	238.9	0.0	0.0	1437.
1	-1.74	31.80	1	25.61	239.1	0.02	0.00	1437.
3	-1.75	31.80	3	25.61	239.2	0.07	0.00	1437.
5	-1.75	31.80	5	25.61	239.3	0.12	0.00	1437.
7	-1.75	31.80	7	25.60	239.6	0.17	0.01	1437.
10	-1.75	31.80	10	25.61	238.9	0.24	0.01	1437.
15	-1.75	31.86	15	25.66	234.3	0.36	0.03	1437.
20	-1.76	32.08	20	25.83	217.7	0.47	0.05	1437.
30	-1.75	32.31	30	26.02	200.1	0.68	0.10	1438.
50	-1.43	32.95	50	26.53	151.2	1.02	0.24	1441.
75	-1.33	33.09	74	26.64	140.4	1.38	0.46	1442.
100	-1.35	33.14	99	26.68	136.3	1.72	0.77	1442.
125	-1.30	33.20	124	26.73	132.1	2.06	1.15	1443.



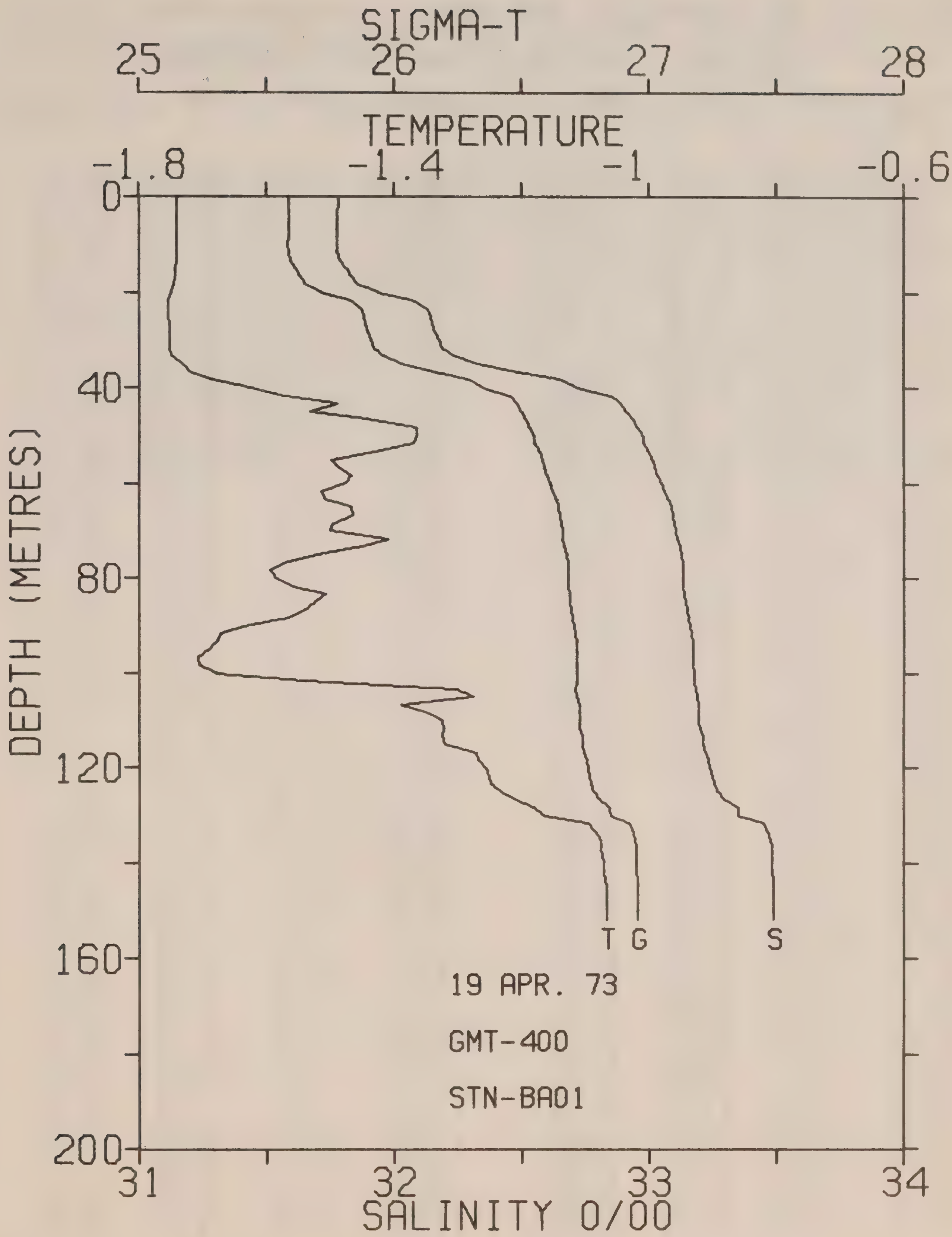
SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G S
19 APR. 73
GMT-300
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 12   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 3.0
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	31.76	25.57	76.67	-1.51	33.13	26.67
1.67	-1.75	31.77	25.58	78.33	-1.54	33.13	26.68
3.33	-1.75	31.77	25.58	80.00	-1.53	33.14	26.68
5.00	-1.75	31.77	25.58	81.67	-1.54	33.14	26.69
6.67	-1.75	31.77	25.58	83.33	-1.53	33.14	26.69
8.33	-1.75	31.77	25.58	85.00	-1.52	33.14	26.69
10.00	-1.75	31.77	25.58	86.67	-1.53	33.15	26.69
11.67	-1.75	31.78	25.59	88.33	-1.54	33.15	26.69
13.33	-1.75	31.78	25.59	90.00	-1.62	33.17	26.71
15.00	-1.75	31.80	25.60	91.67	-1.63	33.16	26.71
16.67	-1.75	31.81	25.61	93.33	-1.63	33.16	26.71
18.33	-1.75	31.82	25.62	95.00	-1.64	33.17	26.71
20.00	-1.75	31.85	25.65	96.67	-1.65	33.17	26.71
21.67	-1.75	31.88	25.67	98.33	-1.64	33.17	26.71
23.33	-1.76	31.99	25.76	100.00	-1.63	33.17	26.71
25.00	-1.76	32.09	25.84	101.67	-1.52	33.17	26.71
26.67	-1.76	32.15	25.89	103.33	-1.41	33.18	26.71
28.33	-1.76	32.17	25.91	105.00	-1.39	33.18	26.72
30.00	-1.76	32.22	25.94	106.67	-1.40	33.19	26.72
31.67	-1.75	32.24	25.96	108.33	-1.37	33.19	26.72
33.33	-1.74	32.32	26.03	110.00	-1.40	33.19	26.73
35.00	-1.73	32.40	26.09	111.67	-1.40	33.19	26.73
36.67	-1.72	32.54	26.20	113.33	-1.42	33.20	26.73
38.33	-1.68	32.71	26.34	115.00	-1.43	33.20	26.73
40.00	-1.65	32.77	26.39	116.67	-1.43	33.20	26.73
41.67	-1.62	32.82	26.43	118.33	-1.45	33.20	26.74
43.33	-1.58	32.86	26.46	120.00	-1.41	33.20	26.73
45.00	-1.59	32.89	26.49	121.67	-1.33	33.22	26.74
46.67	-1.50	32.91	26.50	123.33	-1.29	33.23	26.75
48.33	-1.39	32.94	26.52	125.00	-1.27	33.24	26.76
50.00	-1.38	32.97	26.54	126.67	-1.27	33.25	26.77
51.67	-1.41	32.99	26.56	128.34	-1.25	33.27	26.78
53.33	-1.44	33.00	26.57	130.00	-1.22	33.29	26.80
55.00	-1.42	33.02	26.58	131.67	-1.18	33.36	26.85
56.67	-1.46	33.03	26.59	133.34	-1.13	33.42	26.90
58.33	-1.48	33.04	26.60	135.00	-1.09	33.48	26.94
60.00	-1.47	33.06	26.62	136.67	-1.08	33.48	26.95
61.67	-1.47	33.06	26.62	138.34	-1.08	33.49	26.95
63.33	-1.50	33.07	26.63	140.00	-1.08	33.49	26.95
65.00	-1.47	33.09	26.65	141.67	-1.08	33.49	26.95
66.67	-1.52	33.10	26.65	143.34	-1.08	33.49	26.96
68.33	-1.45	33.10	26.65	145.00	-1.08	33.49	26.95
70.00	-1.47	33.11	26.66	146.67	-1.08	33.49	26.95
71.67	-1.50	33.11	26.66	148.34	-1.07	33.49	26.95
73.33	-1.58	33.13	26.68	150.00	-1.07	33.49	26.95
75.00	-1.55	33.12	26.67				

REFERENCE NO. 73-473- 12 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 3.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	31.76	0	25.57	242.0	0.0	0.0	1437.
1	-1.75	31.77	1	25.58	242.0	0.02	0.00	1437.
3	-1.75	31.77	3	25.58	241.6	0.07	0.00	1437.
5	-1.75	31.77	5	25.58	241.7	0.12	0.00	1437.
7	-1.75	31.77	7	25.58	241.7	0.17	0.01	1437.
10	-1.75	31.77	10	25.58	241.4	0.24	0.01	1437.
15	-1.75	31.80	15	25.60	239.6	0.36	0.03	1437.
20	-1.75	31.85	20	25.65	235.2	0.48	0.05	1437.
30	-1.76	32.22	30	25.94	207.1	0.70	0.10	1438.
50	-1.38	32.97	50	26.54	149.9	1.05	0.24	1441.
75	-1.55	33.12	74	26.67	137.3	1.40	0.47	1441.
100	-1.63	33.17	99	26.71	133.5	1.74	0.77	1441.
125	-1.27	33.24	124	26.76	129.1	2.07	1.15	1443.
150	-1.07	33.49	149	26.95	110.7	2.36	1.55	1445.

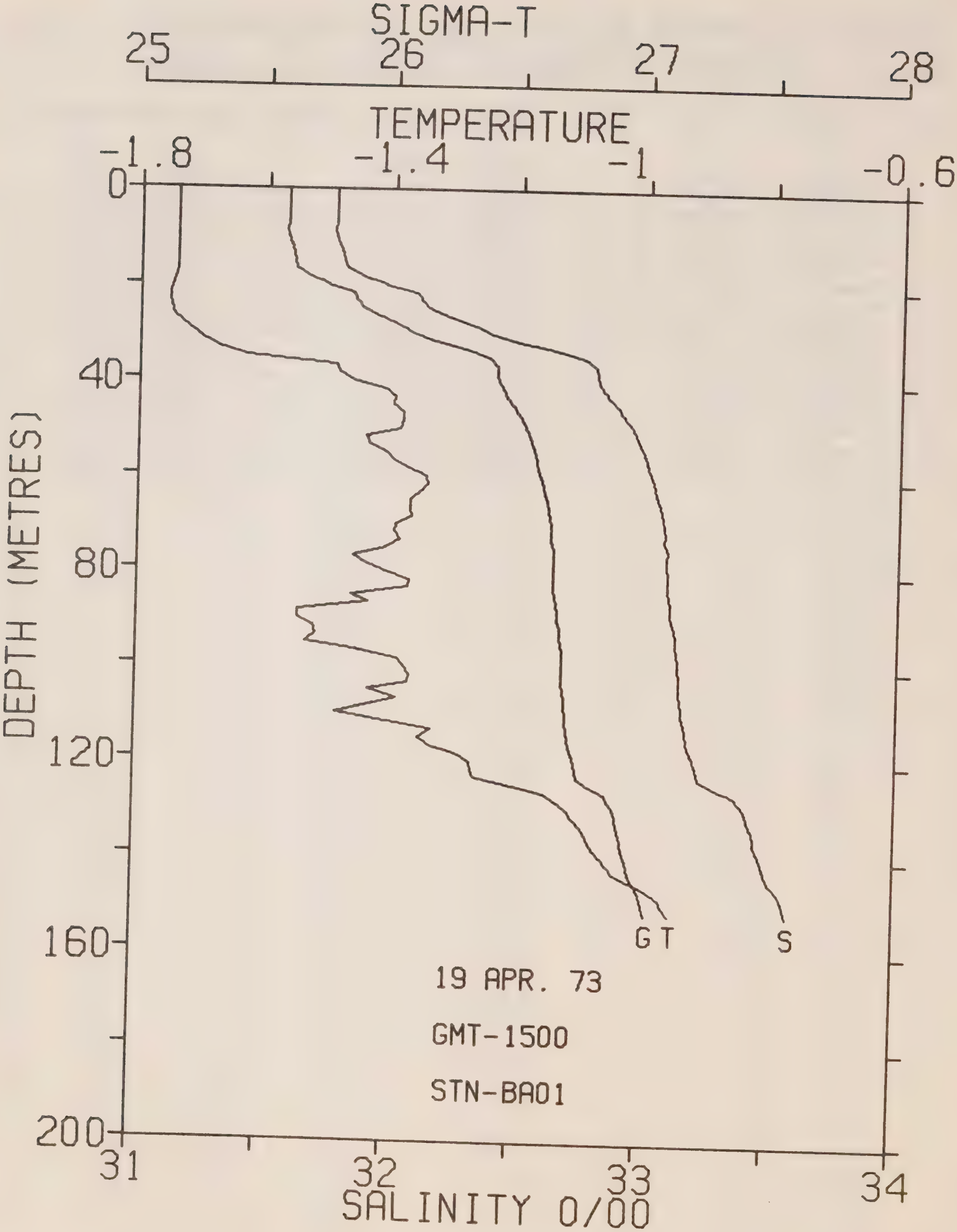

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G S
19 APR. 73
GMT-400
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 13 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 4.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.78	25.59	76.67	-1.57	33.13	26.68
1.67	-1.74	31.78	25.59	78.33	-1.59	33.13	26.68
3.33	-1.74	31.78	25.59	80.00	-1.59	33.13	26.68
5.00	-1.74	31.78	25.59	81.67	-1.56	33.14	26.68
6.67	-1.74	31.78	25.59	83.33	-1.51	33.14	26.69
8.33	-1.74	31.78	25.59	85.00	-1.52	33.15	26.69
10.00	-1.74	31.78	25.59	86.67	-1.54	33.15	26.69
11.67	-1.74	31.78	25.59	88.33	-1.56	33.15	26.70
13.33	-1.74	31.79	25.60	90.00	-1.64	33.16	26.71
15.00	-1.74	31.82	25.62	91.67	-1.67	33.17	26.71
16.67	-1.74	31.84	25.63	93.33	-1.68	33.17	26.71
18.33	-1.74	31.86	25.66	95.00	-1.69	33.17	26.72
20.00	-1.75	31.94	25.72	96.67	-1.71	33.17	26.72
21.67	-1.75	32.07	25.83	98.33	-1.70	33.17	26.72
23.33	-1.75	32.13	25.87	100.00	-1.68	33.18	26.72
25.00	-1.75	32.14	25.88	101.67	-1.54	33.18	26.72
26.67	-1.75	32.15	25.89	103.33	-1.30	33.18	26.71
28.33	-1.75	32.16	25.90	105.00	-1.28	33.19	26.72
30.00	-1.75	32.18	25.91	106.67	-1.39	33.20	26.73
31.67	-1.75	32.19	25.92	108.33	-1.34	33.19	26.73
33.33	-1.75	32.23	25.96	110.00	-1.32	33.20	26.73
35.00	-1.73	32.33	26.03	111.67	-1.32	33.20	26.73
36.67	-1.72	32.49	26.16	113.33	-1.32	33.21	26.74
38.33	-1.68	32.65	26.29	115.00	-1.32	33.21	26.74
40.00	-1.62	32.72	26.35	116.67	-1.27	33.22	26.74
41.67	-1.57	32.85	26.46	118.33	-1.27	33.23	26.75
43.33	-1.49	32.89	26.48	120.00	-1.26	33.24	26.76
45.00	-1.53	32.91	26.50	121.67	-1.25	33.25	26.77
46.67	-1.44	32.94	26.52	123.33	-1.25	33.25	26.77
48.33	-1.36	32.96	26.53	125.00	-1.23	33.27	26.78
50.00	-1.36	32.98	26.55	126.67	-1.21	33.30	26.80
51.67	-1.37	32.98	26.55	128.34	-1.18	33.35	26.85
53.33	-1.43	33.00	26.57	130.00	-1.17	33.35	26.85
55.00	-1.50	33.02	26.58	131.67	-1.10	33.45	26.92
56.67	-1.49	33.02	26.59	133.34	-1.08	33.47	26.94
58.33	-1.47	33.03	26.60	135.00	-1.08	33.48	26.94
60.00	-1.48	33.05	26.61	136.67	-1.08	33.48	26.95
61.67	-1.51	33.06	26.62	138.34	-1.07	33.48	26.95
63.33	-1.51	33.08	26.64	140.00	-1.07	33.48	26.95
65.00	-1.47	33.09	26.64	141.67	-1.07	33.48	26.95
66.67	-1.46	33.10	26.65	143.34	-1.07	33.49	26.96
68.33	-1.50	33.10	26.65	145.00	-1.07	33.49	26.95
70.00	-1.50	33.11	26.66	146.67	-1.07	33.49	26.96
71.67	-1.41	33.11	26.66	148.34	-1.07	33.49	26.96
73.33	-1.45	33.12	26.67	150.00	-1.07	33.49	26.96
75.00	-1.52	33.13	26.68	151.67	-1.07	33.49	26.96

REFERENCE NO. 73-473- 13   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 4.0
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.78	0	25.59	240.5	0.0	0.0	1437.
1	-1.74	31.78	1	25.59	240.8	0.02	0.00	1437.
3	-1.74	31.78	3	25.59	240.9	0.07	0.00	1437.
5	-1.74	31.78	5	25.59	241.0	0.12	0.00	1437.
7	-1.74	31.78	7	25.59	241.1	0.17	0.01	1437.
10	-1.74	31.78	10	25.59	241.1	0.24	0.01	1437.
15	-1.74	31.82	15	25.62	237.9	0.36	0.03	1437.
20	-1.75	31.94	20	25.72	228.4	0.48	0.05	1437.
30	-1.75	32.18	30	25.91	210.0	0.69	0.10	1438.
50	-1.36	32.98	50	26.55	149.5	1.04	0.24	1441.
75	-1.52	33.13	74	26.68	137.0	1.40	0.47	1441.
100	-1.68	33.18	99	26.72	132.9	1.74	0.77	1441.
125	-1.23	33.27	124	26.78	126.6	2.06	1.14	1443.
150	-1.07	33.49	149	26.96	110.2	2.35	1.54	1445.

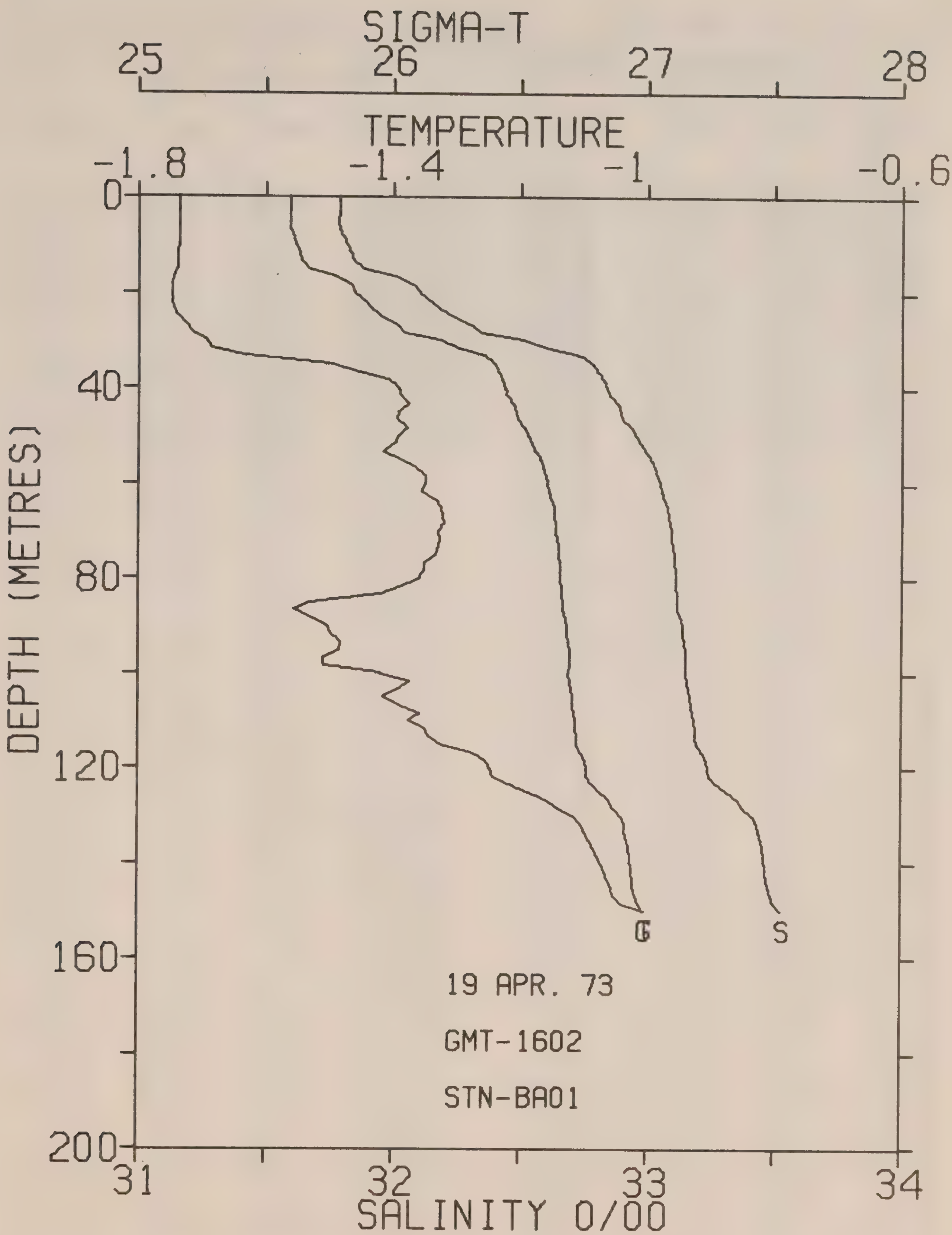

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
G T
S
19 APR. 73
GMT-1500
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 14 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 15.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.77	25.58	76.67	-1.46	33.09	26.64
1.67	-1.74	31.77	25.58	78.33	-1.44	33.09	26.64
3.33	-1.74	31.77	25.58	80.00	-1.41	33.10	26.65
5.00	-1.74	31.77	25.58	81.67	-1.37	33.09	26.64
6.67	-1.74	31.77	25.58	83.33	-1.37	33.10	26.65
8.33	-1.74	31.76	25.57	85.00	-1.46	33.10	26.65
10.00	-1.74	31.77	25.58	86.67	-1.43	33.10	26.65
11.67	-1.74	31.78	25.59	88.33	-1.54	33.11	26.66
13.33	-1.74	31.79	25.60	90.00	-1.54	33.11	26.66
15.00	-1.74	31.80	25.60	91.67	-1.52	33.12	26.67
16.67	-1.74	31.81	25.61	93.33	-1.52	33.13	26.67
18.33	-1.74	31.88	25.67	95.00	-1.53	33.13	26.68
20.00	-1.75	31.97	25.74	96.67	-1.45	33.14	26.68
21.67	-1.75	32.09	25.84	98.33	-1.39	33.14	26.68
23.33	-1.75	32.11	25.86	100.00	-1.38	33.14	26.68
25.00	-1.75	32.14	25.88	101.67	-1.37	33.14	26.68
26.67	-1.75	32.22	25.95	103.33	-1.37	33.14	26.69
28.33	-1.73	32.32	26.03	105.00	-1.43	33.14	26.69
30.00	-1.72	32.38	26.07	106.67	-1.39	33.15	26.69
31.67	-1.70	32.50	26.17	108.33	-1.44	33.15	26.70
33.33	-1.67	32.64	26.28	110.00	-1.48	33.16	26.70
35.00	-1.63	32.76	26.38	111.67	-1.40	33.16	26.70
36.67	-1.49	32.80	26.41	113.33	-1.33	33.17	26.71
38.33	-1.49	32.80	26.41	115.00	-1.35	33.18	26.71
40.00	-1.46	32.81	26.42	116.67	-1.33	33.18	26.72
41.67	-1.41	32.84	26.44	118.33	-1.29	33.20	26.73
43.33	-1.40	32.85	26.45	120.00	-1.27	33.21	26.74
45.00	-1.40	32.89	26.48	121.67	-1.27	33.22	26.74
46.67	-1.38	32.91	26.49	123.33	-1.26	33.23	26.75
48.33	-1.38	32.94	26.52	125.00	-1.20	33.29	26.80
50.00	-1.39	32.95	26.53	126.67	-1.15	33.37	26.86
51.67	-1.44	32.97	26.54	128.34	-1.13	33.39	26.88
53.33	-1.43	32.98	26.56	130.00	-1.11	33.42	26.90
55.00	-1.41	33.00	26.57	131.67	-1.11	33.42	26.90
56.67	-1.40	33.01	26.57	133.34	-1.09	33.44	26.91
58.33	-1.37	33.01	26.58	135.00	-1.09	33.45	26.92
60.00	-1.34	33.03	26.59	136.67	-1.08	33.45	26.93
61.67	-1.34	33.04	26.60	138.34	-1.07	33.46	26.94
63.33	-1.36	33.05	26.60	140.00	-1.06	33.48	26.94
65.00	-1.37	33.06	26.61	141.67	-1.05	33.49	26.96
66.67	-1.37	33.07	26.62	143.34	-1.04	33.50	26.96
68.33	-1.37	33.07	26.63	145.00	-1.01	33.52	26.98
70.00	-1.39	33.08	26.63	146.67	-0.99	33.55	27.00
71.67	-1.39	33.08	26.64	148.34	-0.97	33.57	27.01
73.33	-1.38	33.08	26.63	150.00	-0.96	33.57	27.02
75.00	-1.41	33.09	26.64	151.67	-0.95	33.58	27.03

REFERENCE NO. 73-473- 14 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 15.0
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.77	0	25.58	241.5	0.0	0.0	1437.
1	-1.74	31.77	1	25.58	241.8	0.02	0.00	1437.
3	-1.74	31.77	3	25.58	241.9	0.07	0.00	1437.
5	-1.74	31.77	5	25.58	241.9	0.12	0.00	1437.
7	-1.74	31.76	7	25.58	242.0	0.17	0.01	1437.
10	-1.74	31.77	10	25.58	241.8	0.24	0.01	1437.
15	-1.74	31.80	15	25.60	239.3	0.36	0.03	1437.
20	-1.75	31.97	20	25.74	226.2	0.48	0.05	1437.
30	-1.72	32.38	30	26.07	194.5	0.69	0.10	1438.
50	-1.39	32.95	50	26.53	151.1	1.02	0.23	1441.
75	-1.41	33.09	74	26.64	140.2	1.38	0.46	1441.
100	-1.38	33.14	99	26.68	136.4	1.73	0.77	1442.
125	-1.20	33.29	124	26.80	125.1	2.06	1.15	1443.
150	-0.96	33.57	149	27.02	104.6	2.34	1.55	1445.

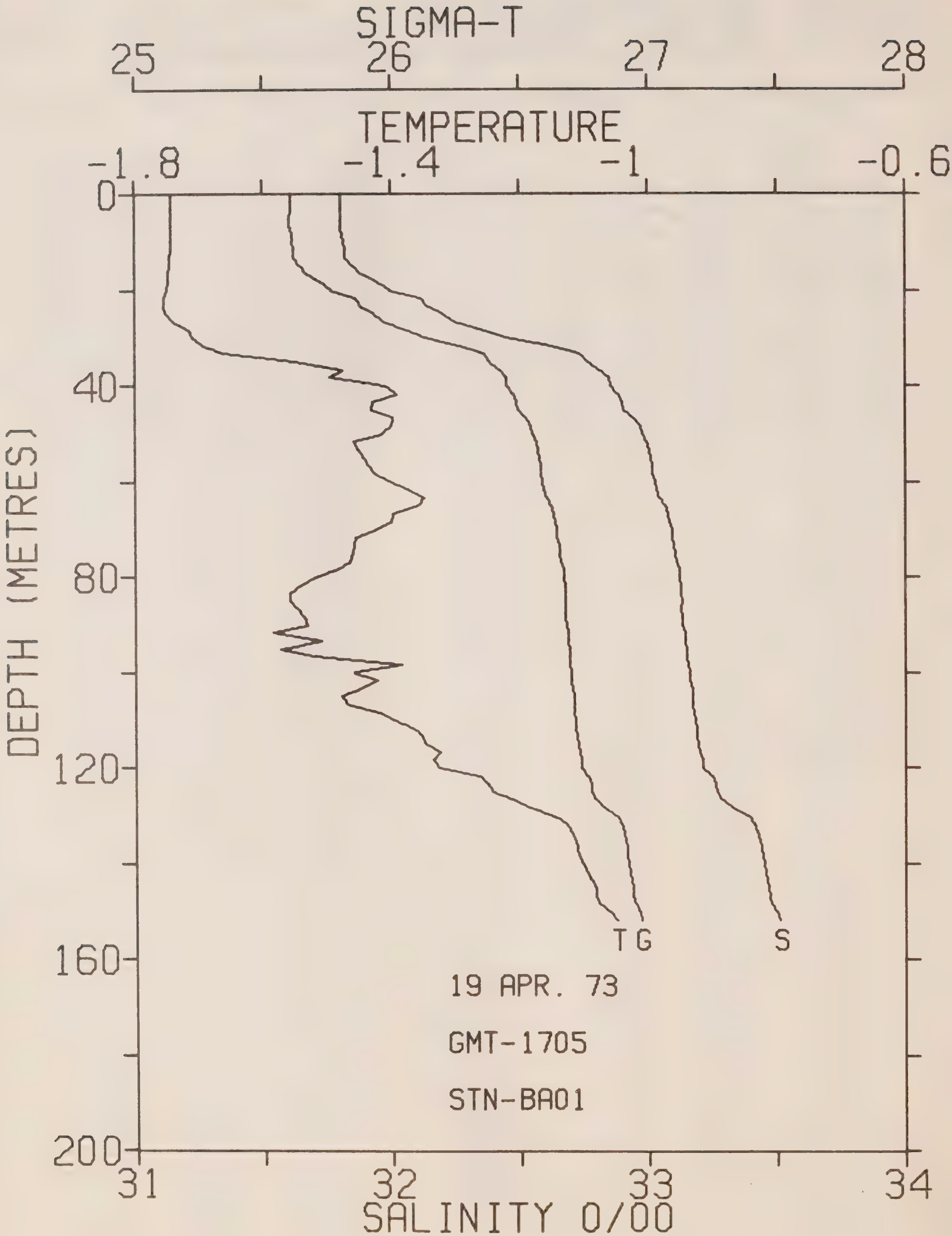

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
G
S
19 APR. 73
GMT-1602
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 15   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 16.0
RESULTS OF STD CAST   90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.73	31.79	25.60	76.67	-1.35	33.11	26.65
1.67	-1.73	31.79	25.59	78.33	-1.35	33.11	26.66
3.33	-1.73	31.79	25.59	80.00	-1.36	33.11	26.66
5.00	-1.73	31.79	25.59	81.67	-1.39	33.11	26.66
6.67	-1.73	31.79	25.59	83.33	-1.42	33.12	26.66
8.33	-1.73	31.81	25.61	85.00	-1.53	33.11	26.67
10.00	-1.74	31.81	25.62	86.67	-1.55	33.12	26.67
11.67	-1.74	31.84	25.63	88.33	-1.53	33.13	26.68
13.33	-1.74	31.84	25.64	90.00	-1.50	33.14	26.68
15.00	-1.74	31.88	25.67	91.67	-1.50	33.14	26.68
16.67	-1.74	32.01	25.77	93.33	-1.48	33.14	26.69
18.33	-1.75	32.08	25.83	95.00	-1.48	33.15	26.69
20.00	-1.75	32.10	25.85	96.67	-1.51	33.15	26.70
21.67	-1.75	32.14	25.88	98.33	-1.51	33.15	26.69
23.33	-1.74	32.18	25.91	100.00	-1.42	33.15	26.69
25.00	-1.74	32.23	25.95	101.67	-1.37	33.15	26.69
26.67	-1.72	32.30	26.01	103.33	-1.39	33.16	26.70
28.33	-1.71	32.35	26.05	105.00	-1.42	33.17	26.71
30.00	-1.69	32.51	26.18	106.67	-1.39	33.17	26.71
31.67	-1.69	32.61	26.26	108.33	-1.36	33.18	26.71
33.33	-1.63	32.74	26.36	110.00	-1.38	33.18	26.72
35.00	-1.50	32.79	26.40	111.67	-1.35	33.19	26.72
36.67	-1.45	32.81	26.41	113.33	-1.34	33.19	26.72
38.33	-1.41	32.83	26.43	115.00	-1.32	33.19	26.72
40.00	-1.39	32.84	26.44	116.67	-1.27	33.22	26.74
41.67	-1.39	32.85	26.45	118.33	-1.26	33.23	26.75
43.33	-1.38	32.88	26.47	120.00	-1.25	33.24	26.76
45.00	-1.39	32.89	26.48	121.67	-1.24	33.25	26.76
46.67	-1.39	32.90	26.49	123.33	-1.22	33.27	26.78
48.33	-1.38	32.94	26.52	125.00	-1.19	33.31	26.82
50.00	-1.39	32.95	26.53	126.67	-1.16	33.35	26.85
51.67	-1.40	32.97	26.55	128.34	-1.14	33.38	26.87
53.33	-1.42	32.99	26.56	130.00	-1.11	33.42	26.90
55.00	-1.39	33.02	26.58	131.67	-1.10	33.43	26.91
56.67	-1.36	33.03	26.59	133.34	-1.10	33.44	26.91
58.33	-1.35	33.04	26.60	135.00	-1.09	33.45	26.92
60.00	-1.35	33.05	26.61	136.67	-1.09	33.45	26.93
61.67	-1.35	33.06	26.61	138.34	-1.08	33.46	26.93
63.33	-1.33	33.07	26.62	140.00	-1.07	33.46	26.94
65.00	-1.32	33.08	26.63	141.67	-1.07	33.47	26.94
66.67	-1.32	33.08	26.64	143.34	-1.06	33.47	26.94
68.33	-1.32	33.09	26.64	145.00	-1.06	33.48	26.95
70.00	-1.33	33.09	26.64	146.67	-1.05	33.49	26.95
71.67	-1.33	33.10	26.65	148.34	-1.04	33.50	26.96
73.33	-1.33	33.10	26.65	150.00	-1.00	33.53	26.98
75.00	-1.33	33.10	26.65				

REFERENCE NO. 73-473- 15   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 16.0
RESULTS OF STD CAST   90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.73	31.79	0	25.60	240.1	0.0	0.0	1437.
1	-1.73	31.79	1	25.59	240.3	0.02	0.00	1437.
3	-1.73	31.79	3	25.59	240.4	0.07	0.00	1437.
5	-1.73	31.79	5	25.59	240.4	0.12	0.00	1437.
7	-1.73	31.79	7	25.60	240.0	0.17	0.01	1437.
10	-1.74	31.81	10	25.62	238.2	0.24	0.01	1437.
15	-1.74	31.88	15	25.67	232.8	0.36	0.03	1437.
20	-1.75	32.10	20	25.85	215.7	0.47	0.05	1437.
30	-1.69	32.51	30	26.18	184.3	0.67	0.10	1438.
50	-1.39	32.95	50	26.53	151.1	1.00	0.23	1441.
75	-1.33	33.10	74	26.65	139.5	1.35	0.46	1442.
100	-1.42	33.15	99	26.69	135.6	1.70	0.76	1442.
125	-1.19	33.31	124	26.82	123.5	2.03	1.14	1443.

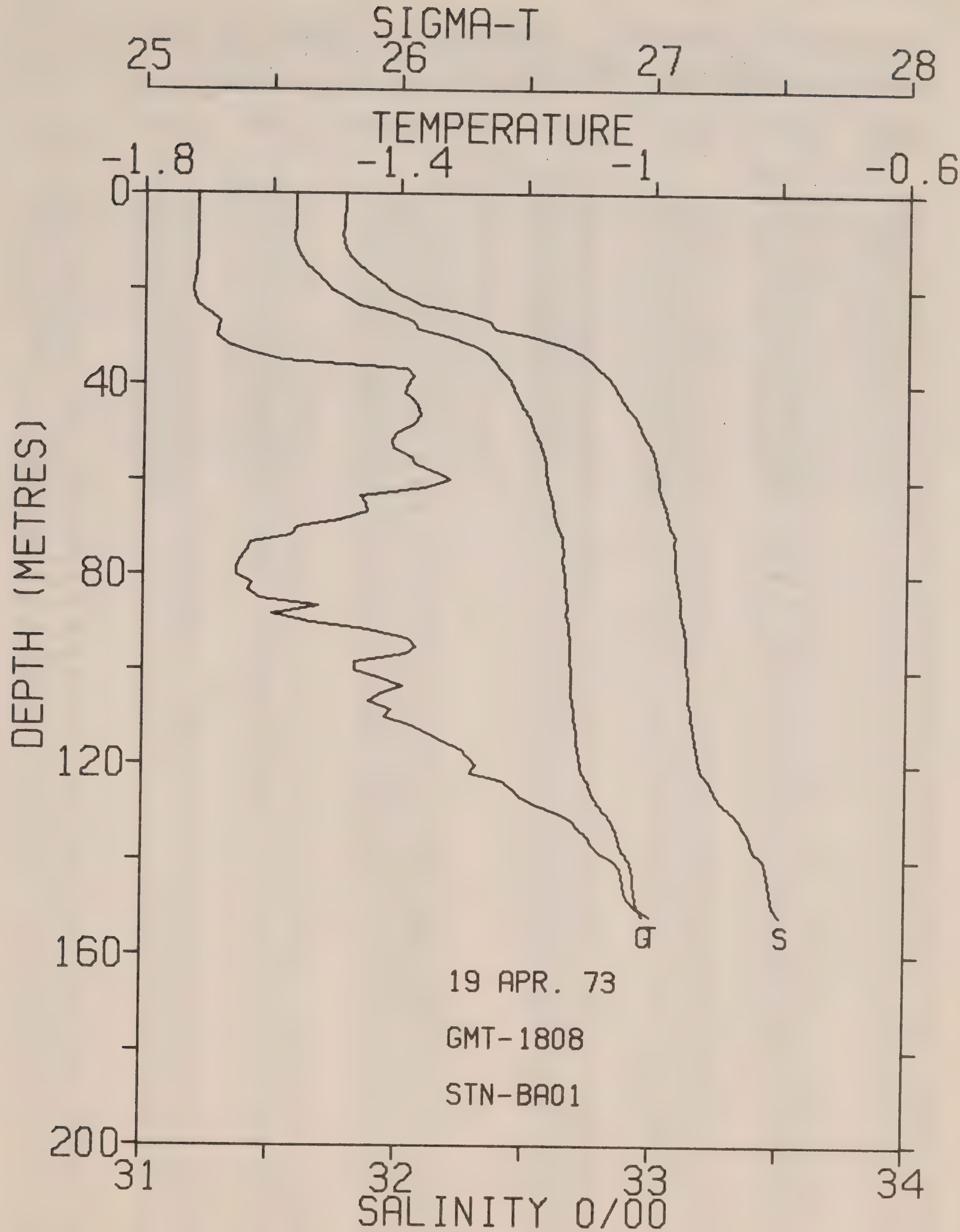

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
G
S
19 APR. 73
GMT-1705
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 16 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 17.1
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.81	25.61	76.67	-1.46	33.11	26.66
1.67	-1.74	31.81	25.61	78.33	-1.48	33.12	26.67
3.33	-1.74	31.81	25.61	80.00	-1.52	33.12	26.67
5.00	-1.74	31.80	25.61	81.67	-1.54	33.13	26.68
6.67	-1.74	31.80	25.61	83.33	-1.56	33.13	26.68
8.33	-1.74	31.81	25.61	85.00	-1.56	33.13	26.68
10.00	-1.74	31.82	25.62	86.67	-1.55	33.13	26.68
11.67	-1.74	31.82	25.62	88.33	-1.54	33.13	26.68
13.33	-1.74	31.82	25.62	90.00	-1.53	33.13	26.68
15.00	-1.74	31.86	25.65	91.67	-1.59	33.14	26.69
16.67	-1.75	31.89	25.67	93.33	-1.51	33.14	26.69
18.33	-1.75	31.95	25.73	95.00	-1.57	33.15	26.70
20.00	-1.75	32.00	25.76	96.67	-1.52	33.15	26.70
21.67	-1.75	32.12	25.86	98.33	-1.39	33.16	26.70
23.33	-1.75	32.15	25.89	100.00	-1.46	33.16	26.70
25.00	-1.75	32.20	25.93	101.67	-1.42	33.16	26.70
26.67	-1.74	32.25	25.97	103.33	-1.45	33.17	26.71
28.33	-1.71	32.37	26.06	105.00	-1.48	33.17	26.71
30.00	-1.71	32.45	26.13	106.67	-1.47	33.17	26.71
31.67	-1.69	32.63	26.27	108.33	-1.42	33.18	26.71
33.33	-1.66	32.73	26.36	110.00	-1.40	33.18	26.72
35.00	-1.55	32.77	26.38	111.67	-1.37	33.19	26.72
36.67	-1.48	32.81	26.42	113.33	-1.35	33.19	26.72
38.33	-1.50	32.85	26.45	115.00	-1.35	33.20	26.73
40.00	-1.41	32.86	26.45	116.67	-1.32	33.20	26.73
41.67	-1.39	32.89	26.48	118.33	-1.34	33.21	26.74
43.33	-1.43	32.90	26.49	120.00	-1.33	33.21	26.74
45.00	-1.43	32.91	26.49	121.67	-1.26	33.25	26.77
46.67	-1.40	32.94	26.52	123.33	-1.25	33.26	26.78
48.33	-1.40	32.97	26.54	125.00	-1.24	33.27	26.78
50.00	-1.42	32.98	26.55	126.67	-1.21	33.29	26.80
51.67	-1.46	32.99	26.57	128.34	-1.18	33.33	26.83
53.33	-1.45	33.00	26.57	130.00	-1.15	33.39	26.88
55.00	-1.44	33.01	26.58	131.67	-1.13	33.41	26.90
56.67	-1.43	33.02	26.58	133.34	-1.12	33.42	26.90
58.33	-1.42	33.01	26.58	135.00	-1.11	33.44	26.91
60.00	-1.41	33.03	26.59	136.67	-1.11	33.44	26.92
61.67	-1.37	33.03	26.60	138.34	-1.11	33.44	26.92
63.33	-1.35	33.05	26.60	140.00	-1.10	33.45	26.92
65.00	-1.36	33.07	26.62	141.67	-1.10	33.46	26.93
66.67	-1.40	33.08	26.63	143.34	-1.09	33.46	26.93
68.33	-1.40	33.08	26.64	145.00	-1.08	33.47	26.94
70.00	-1.42	33.09	26.64	146.67	-1.08	33.47	26.94
71.67	-1.45	33.09	26.65	148.34	-1.08	33.48	26.95
73.33	-1.46	33.10	26.65	150.00	-1.06	33.50	26.96
75.00	-1.46	33.11	26.66	151.67	-1.05	33.51	26.97

REFERENCE NO. 73-473- 16 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 17.1
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.81	0	25.61	238.6	0.0	0.0	1437.
1	-1.74	31.81	1	25.61	238.8	0.02	0.00	1437.
3	-1.74	31.81	3	25.61	238.9	0.07	0.00	1437.
5	-1.74	31.80	5	25.61	239.0	0.12	0.00	1437.
7	-1.74	31.81	7	25.61	239.0	0.17	0.01	1437.
10	-1.74	31.82	10	25.62	237.9	0.24	0.01	1437.
15	-1.74	31.86	15	25.65	235.0	0.36	0.03	1437.
20	-1.75	32.00	20	25.76	224.0	0.47	0.05	1437.
30	-1.71	32.45	30	26.13	189.1	0.68	0.10	1438.
50	-1.42	32.98	50	26.55	149.1	1.00	0.23	1441.
75	-1.46	33.11	74	26.66	138.8	1.36	0.46	1441.
100	-1.46	33.16	99	26.70	134.5	1.70	0.76	1442.
125	-1.24	33.27	124	26.78	127.1	2.03	1.14	1443.
150	-1.06	33.50	149	26.96	109.6	2.32	1.54	1445.



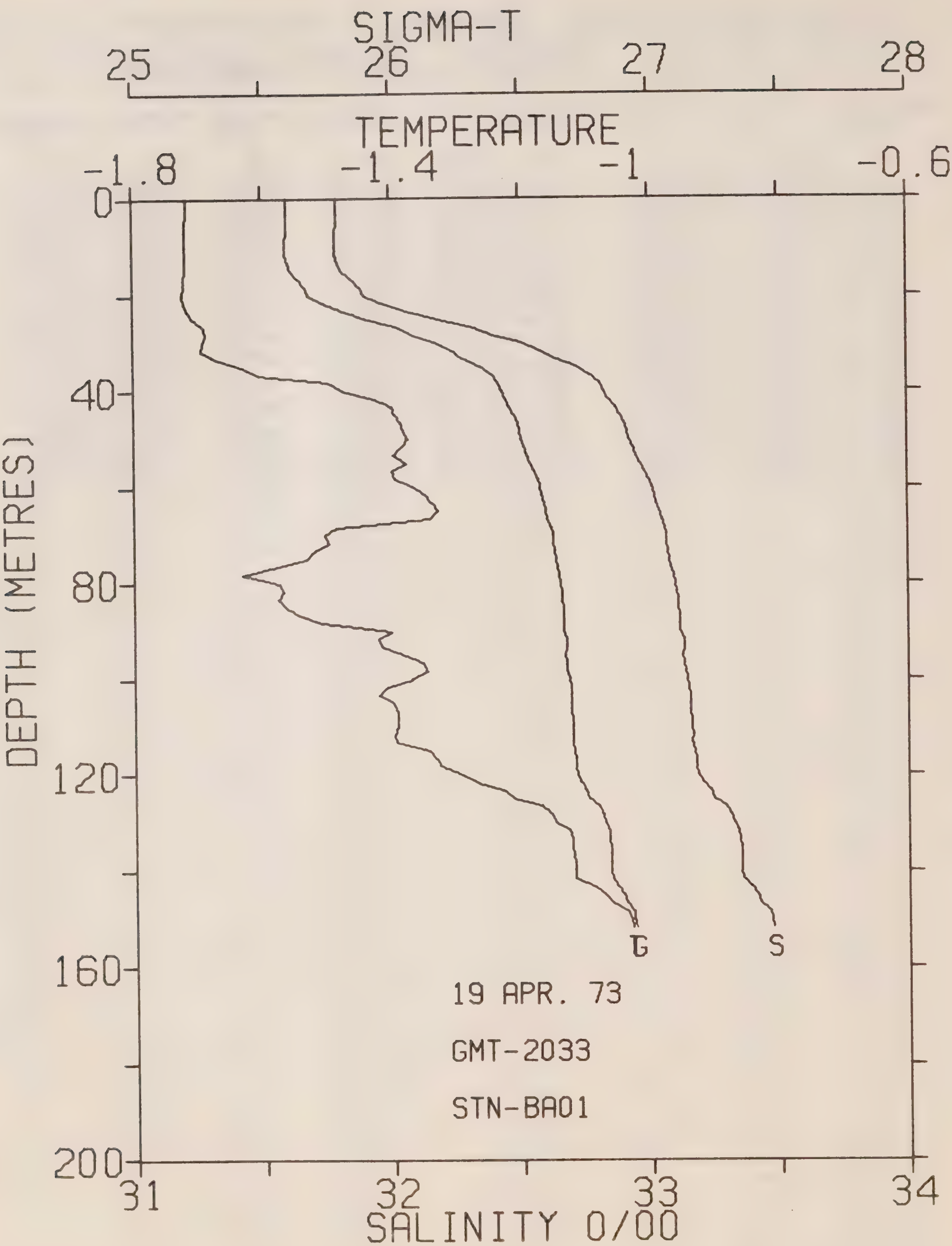
SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
σT
S
19 APR. 73
GMT-1808
STN-BA01
31
32
33
34
SALINITY 0/00

REFFRENCE NO. 73-473- 17   STN- BA01   DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 18.1
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.72	31.78	25.59	76.67	-1.65	33.09	26.65
1.67	-1.72	31.78	25.59	78.33	-1.65	33.09	26.65
3.33	-1.72	31.78	25.59	80.00	-1.65	33.10	26.65
5.00	-1.72	31.78	25.59	81.67	-1.63	33.10	26.66
6.67	-1.72	31.78	25.59	83.33	-1.63	33.10	26.66
8.33	-1.72	31.77	25.58	85.00	-1.62	33.11	26.66
10.00	-1.72	31.78	25.59	86.67	-1.52	33.11	26.66
11.67	-1.72	31.79	25.59	88.33	-1.60	33.11	26.66
13.33	-1.72	31.81	25.61	90.00	-1.53	33.12	26.67
15.00	-1.72	31.84	25.63	91.67	-1.45	33.13	26.67
16.67	-1.72	31.87	25.66	93.33	-1.39	33.13	26.68
18.33	-1.72	31.92	25.70	95.00	-1.37	33.13	26.68
20.00	-1.72	31.95	25.73	96.67	-1.39	33.13	26.68
21.67	-1.72	32.02	25.78	98.33	-1.47	33.14	26.68
23.33	-1.72	32.09	25.84	100.00	-1.47	33.14	26.68
25.00	-1.70	32.24	25.96	101.67	-1.43	33.14	26.69
26.67	-1.68	32.35	26.05	103.33	-1.39	33.14	26.69
28.33	-1.69	32.38	26.07	105.00	-1.42	33.14	26.69
30.00	-1.69	32.52	26.19	106.67	-1.44	33.15	26.69
31.67	-1.67	32.64	26.28	108.33	-1.41	33.15	26.69
33.33	-1.64	32.71	26.34	110.00	-1.42	33.16	26.70
35.00	-1.59	32.75	26.37	111.67	-1.38	33.16	26.70
36.67	-1.39	32.79	26.40	113.33	-1.35	33.17	26.70
38.33	-1.38	32.82	26.42	115.00	-1.33	33.17	26.71
40.00	-1.39	32.85	26.44	116.67	-1.30	33.18	26.71
41.67	-1.39	32.86	26.46	118.33	-1.29	33.19	26.72
43.33	-1.38	32.88	26.47	120.00	-1.28	33.19	26.72
45.00	-1.37	32.90	26.49	121.67	-1.28	33.20	26.73
46.67	-1.37	32.93	26.51	123.33	-1.23	33.23	26.75
48.33	-1.38	32.94	26.52	125.00	-1.22	33.25	26.76
50.00	-1.40	32.95	26.53	126.67	-1.21	33.25	26.77
51.67	-1.41	32.97	26.55	128.34	-1.18	33.28	26.79
53.33	-1.41	32.99	26.56	130.00	-1.14	33.32	26.82
55.00	-1.38	33.01	26.57	131.67	-1.12	33.35	26.84
56.67	-1.38	33.01	26.58	133.34	-1.11	33.37	26.86
58.33	-1.34	33.01	26.58	135.00	-1.10	33.39	26.88
60.00	-1.32	33.02	26.59	136.67	-1.09	33.39	26.88
61.67	-1.36	33.02	26.59	138.34	-1.08	33.41	26.89
63.33	-1.46	33.03	26.60	140.00	-1.06	33.44	26.92
65.00	-1.45	33.04	26.61	141.67	-1.05	33.46	26.93
66.67	-1.45	33.05	26.61	143.34	-1.04	33.46	26.93
68.33	-1.49	33.06	26.62	145.00	-1.04	33.47	26.94
70.00	-1.56	33.06	26.63	146.67	-1.04	33.47	26.94
71.67	-1.57	33.09	26.65	148.34	-1.03	33.48	26.94
73.33	-1.63	33.08	26.64	150.00	-1.02	33.48	26.95
75.00	-1.64	33.09	26.65	151.67	-1.00	33.51	26.97

REFERENCE NO. 73-473- 17 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 18.1
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.72	31.78	0	25.59	240.5	0.0	0.0	1437.
1	-1.72	31.78	1	25.59	240.8	0.02	0.00	1437.
3	-1.72	31.78	3	25.59	240.9	0.07	0.00	1437.
5	-1.72	31.78	5	25.59	240.9	0.12	0.00	1437.
7	-1.72	31.78	7	25.59	241.1	0.17	0.01	1437.
10	-1.72	31.78	10	25.59	241.1	0.24	0.01	1437.
15	-1.72	31.84	15	25.63	236.4	0.36	0.03	1437.
20	-1.72	31.95	20	25.73	227.4	0.48	0.05	1437.
30	-1.69	32.52	30	26.19	183.6	0.68	0.10	1438.
50	-1.40	32.95	50	26.53	151.0	1.01	0.23	1441.
75	-1.64	33.09	74	26.65	139.7	1.37	0.46	1440.
100	-1.47	33.14	99	26.68	136.2	1.71	0.77	1442.
125	-1.22	33.25	124	26.76	128.6	2.05	1.15	1443.
150	-1.02	33.48	149	26.95	110.9	2.34	1.56	1445.

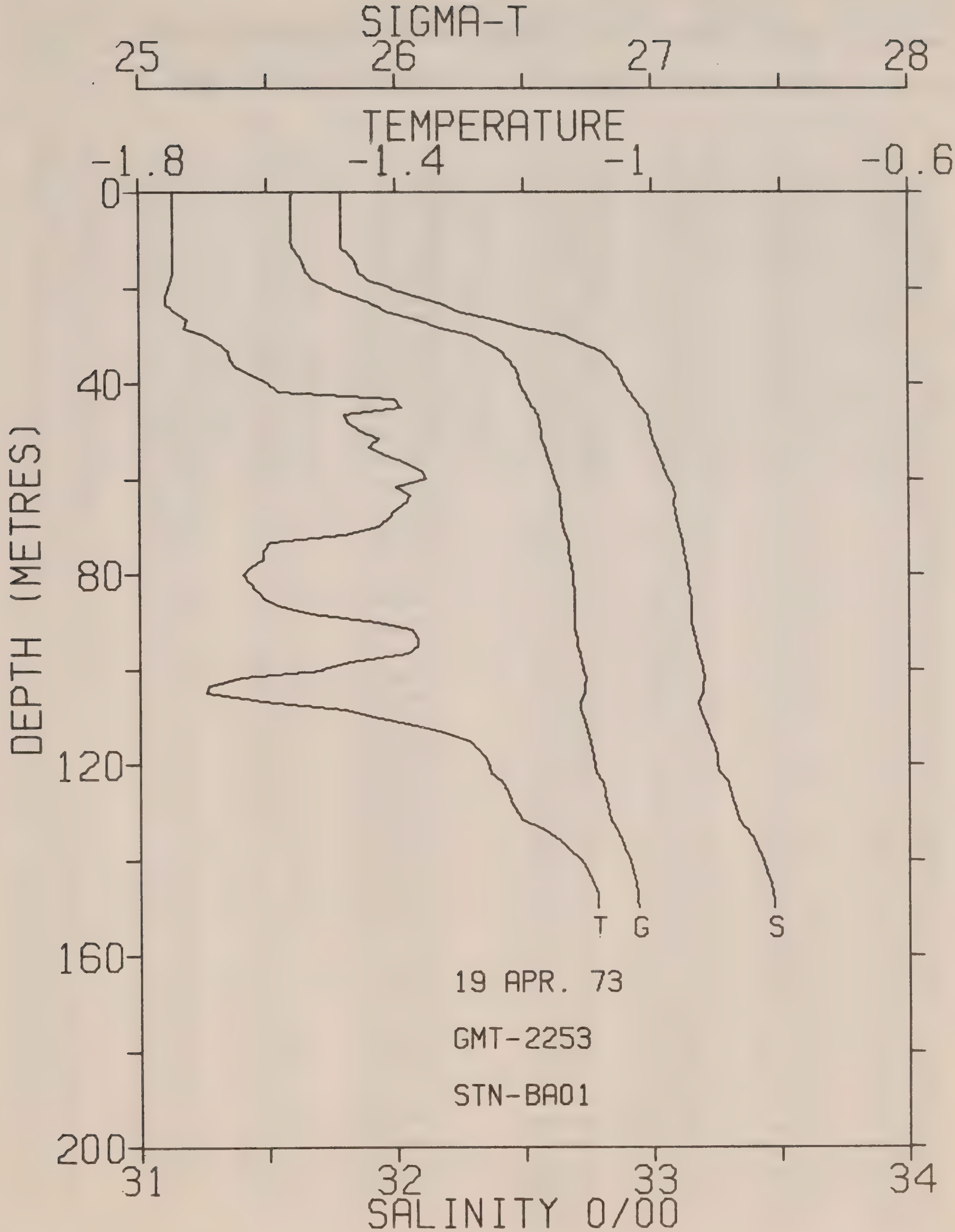

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
G
S
19 APR. 73
GMT-2033
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 18 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 20.5
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.72	31.80	25.60	76.67	-1.59	33.09	26.64
1.67	-1.72	31.79	25.60	78.33	-1.63	33.09	26.65
3.33	-1.72	31.79	25.60	80.00	-1.57	33.10	26.66
5.00	-1.72	31.79	25.60	81.67	-1.57	33.11	26.66
6.67	-1.72	31.79	25.60	83.33	-1.57	33.11	26.66
8.33	-1.72	31.79	25.60	85.00	-1.56	33.11	26.66
10.00	-1.72	31.79	25.60	86.67	-1.54	33.12	26.67
11.67	-1.72	31.79	25.60	88.33	-1.51	33.12	26.67
13.33	-1.72	31.80	25.60	90.00	-1.40	33.12	26.66
15.00	-1.72	31.82	25.62	91.67	-1.42	33.13	26.68
16.67	-1.72	31.85	25.65	93.33	-1.41	33.13	26.68
18.33	-1.72	31.88	25.67	95.00	-1.38	33.13	26.67
20.00	-1.72	31.90	25.69	96.67	-1.35	33.13	26.68
21.67	-1.72	31.97	25.74	98.33	-1.34	33.14	26.68
23.33	-1.71	32.07	25.82	100.00	-1.37	33.15	26.69
25.00	-1.71	32.17	25.90	101.67	-1.41	33.15	26.69
26.67	-1.69	32.31	26.02	103.33	-1.42	33.15	26.69
28.33	-1.69	32.40	26.09	105.00	-1.40	33.16	26.70
30.00	-1.69	32.50	26.17	106.67	-1.39	33.16	26.70
31.67	-1.69	32.58	26.24	108.33	-1.39	33.16	26.70
33.33	-1.67	32.63	26.28	110.00	-1.39	33.16	26.70
35.00	-1.63	32.72	26.35	111.67	-1.40	33.16	26.70
36.67	-1.61	32.77	26.39	113.33	-1.39	33.16	26.70
38.33	-1.50	32.81	26.42	115.00	-1.34	33.17	26.71
40.00	-1.47	32.83	26.43	116.67	-1.33	33.18	26.71
41.67	-1.42	32.84	26.44	118.33	-1.32	33.18	26.71
43.33	-1.40	32.87	26.46	120.00	-1.29	33.18	26.72
45.00	-1.39	32.89	26.48	121.67	-1.27	33.20	26.73
46.67	-1.39	32.91	26.49	123.33	-1.23	33.23	26.75
48.33	-1.38	32.92	26.50	125.00	-1.21	33.25	26.76
50.00	-1.37	32.92	26.51	126.67	-1.17	33.29	26.80
51.67	-1.38	32.94	26.52	128.34	-1.15	33.31	26.81
53.33	-1.40	32.95	26.53	130.00	-1.15	33.32	26.82
55.00	-1.38	32.97	26.54	131.67	-1.13	33.34	26.84
56.67	-1.40	32.98	26.56	133.34	-1.12	33.35	26.84
58.33	-1.39	33.00	26.57	135.00	-1.12	33.35	26.84
60.00	-1.37	33.01	26.58	136.67	-1.12	33.35	26.84
61.67	-1.35	33.02	26.59	138.34	-1.12	33.35	26.85
63.33	-1.34	33.03	26.59	140.00	-1.12	33.35	26.85
65.00	-1.33	33.04	26.60	141.67	-1.12	33.35	26.85
66.67	-1.34	33.05	26.61	143.34	-1.09	33.39	26.87
68.33	-1.48	33.06	26.62	145.00	-1.07	33.41	26.89
70.00	-1.50	33.07	26.63	146.67	-1.06	33.42	26.90
71.67	-1.50	33.07	26.63	148.34	-1.04	33.46	26.93
73.33	-1.52	33.07	26.63	150.00	-1.03	33.47	26.94
75.00	-1.53	33.08	26.64	151.67	-1.03	33.47	26.94

REFERENCE NO. 73-473- 18 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 20.5
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.72	31.80	0	25.60	239.6	0.0	0.0	1437.
1	-1.72	31.79	1	25.60	239.8	0.02	0.00	1437.
3	-1.72	31.79	3	25.60	239.9	0.07	0.00	1437.
5	-1.72	31.79	5	25.60	240.0	0.12	0.00	1437.
7	-1.72	31.79	7	25.60	240.1	0.17	0.01	1437.
10	-1.72	31.79	10	25.60	240.1	0.24	0.01	1437.
15	-1.72	31.82	15	25.62	238.2	0.36	0.03	1437.
20	-1.72	31.90	20	25.69	231.5	0.48	0.05	1437.
30	-1.69	32.50	30	26.17	185.0	0.69	0.10	1438.
50	-1.37	32.92	50	26.51	153.5	1.01	0.23	1441.
75	-1.53	33.08	74	26.64	140.8	1.38	0.46	1441.
100	-1.37	33.15	99	26.69	135.9	1.72	0.77	1442.
125	-1.21	33.25	124	26.76	128.6	2.06	1.15	1443.
150	-1.03	33.47	149	26.94	112.3	2.36	1.57	1445.


SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
G
S
19 APR. 73
GMT-2253
STN-BA01
31
32
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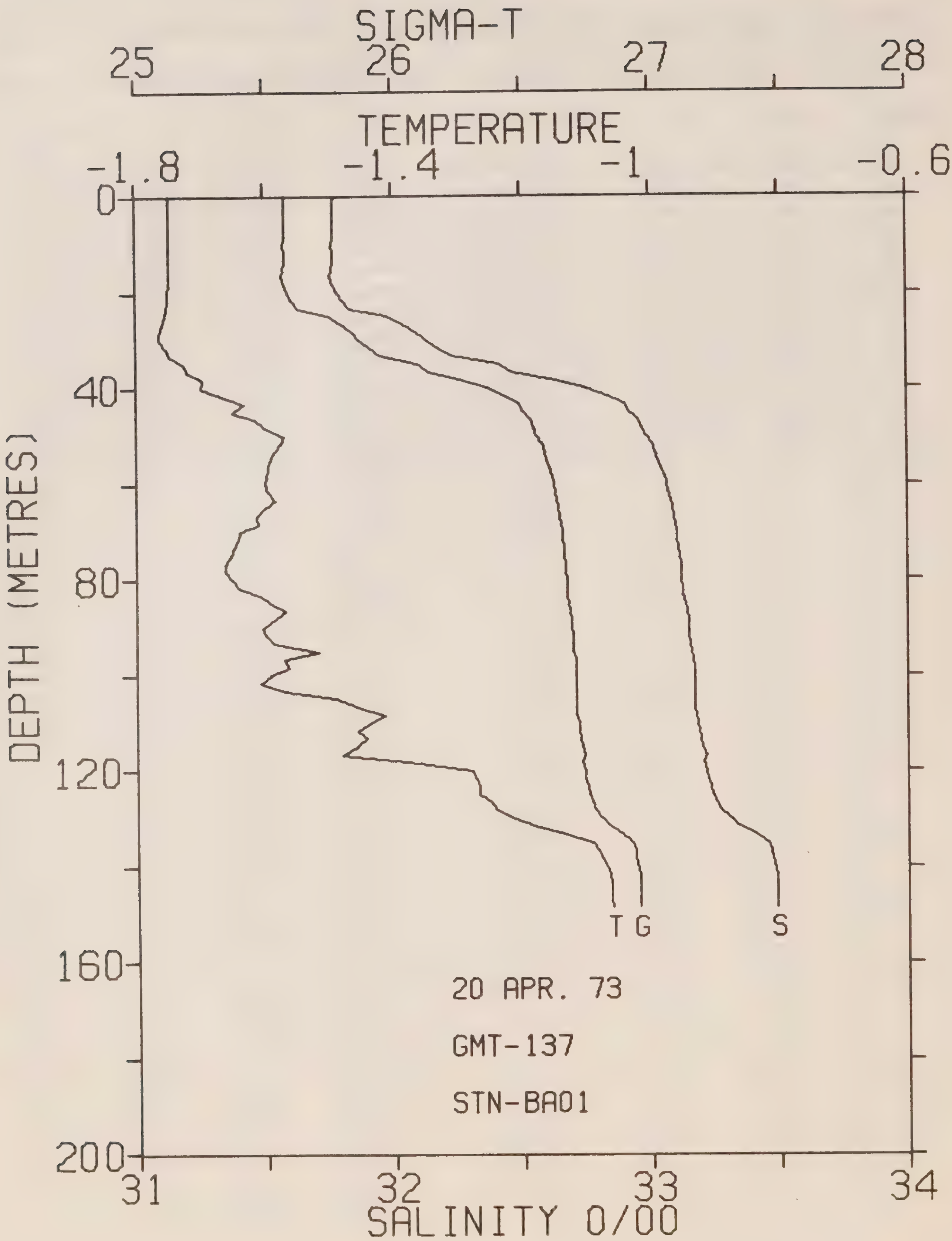
34
SALINITY 0/00

REFERENCE NO. 73-473- 19   STN- BA01   DATF 19/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 22.9
RESULTS OF STD CAST   91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	31.79	25.60	76.67	-1.61	33.13	26.68
1.67	-1.75	31.79	25.60	78.33	-1.62	33.13	26.68
3.33	-1.75	31.79	25.60	80.00	-1.64	33.14	26.69
5.00	-1.75	31.79	25.60	81.67	-1.63	33.14	26.69
6.67	-1.75	31.79	25.59	83.33	-1.62	33.14	26.69
8.33	-1.75	31.79	25.60	85.00	-1.61	33.15	26.70
10.00	-1.75	31.79	25.60	86.67	-1.58	33.15	26.70
11.67	-1.75	31.79	25.60	88.33	-1.53	33.15	26.69
13.33	-1.75	31.83	25.63	90.00	-1.43	33.15	26.69
15.00	-1.75	31.85	25.64	91.67	-1.38	33.16	26.70
16.67	-1.75	31.85	25.65	93.33	-1.37	33.17	26.71
18.33	-1.75	31.89	25.68	95.00	-1.37	33.17	26.71
20.00	-1.75	31.98	25.75	96.67	-1.38	33.18	26.71
21.67	-1.76	32.07	25.83	98.33	-1.47	33.19	26.72
23.33	-1.76	32.19	25.92	100.00	-1.52	33.19	26.73
25.00	-1.74	32.24	25.96	101.67	-1.64	33.20	26.74
26.67	-1.72	32.39	26.08	103.33	-1.69	33.20	26.74
28.33	-1.73	32.50	26.18	105.00	-1.70	33.20	26.73
30.00	-1.70	32.66	26.30	106.67	-1.61	33.18	26.72
31.67	-1.68	32.73	26.35	108.33	-1.48	33.18	26.72
33.33	-1.66	32.80	26.41	110.00	-1.43	33.19	26.73
35.00	-1.66	32.83	26.44	111.67	-1.37	33.21	26.74
36.67	-1.65	32.86	26.46	113.33	-1.33	33.22	26.74
38.33	-1.62	32.88	26.48	115.00	-1.29	33.23	26.76
40.00	-1.60	32.89	26.48	116.67	-1.27	33.24	26.76
41.67	-1.58	32.91	26.50	118.33	-1.26	33.25	26.77
43.33	-1.40	32.93	26.51	120.00	-1.26	33.25	26.77
45.00	-1.39	32.95	26.53	121.67	-1.25	33.26	26.78
46.67	-1.48	32.98	26.56	123.33	-1.24	33.29	26.80
48.33	-1.47	32.99	26.56	125.00	-1.23	33.30	26.81
50.00	-1.45	32.99	26.57	126.67	-1.22	33.31	26.81
51.67	-1.43	33.00	26.57	128.34	-1.22	33.32	26.82
53.33	-1.44	33.01	26.58	130.00	-1.21	33.33	26.83
55.00	-1.41	33.03	26.59	131.67	-1.20	33.33	26.83
56.67	-1.39	33.04	26.60	133.34	-1.17	33.36	26.86
58.33	-1.36	33.05	26.61	135.00	-1.15	33.39	26.87
60.00	-1.35	33.06	26.62	136.67	-1.14	33.40	26.89
61.67	-1.40	33.08	26.63	138.34	-1.13	33.42	26.90
63.33	-1.38	33.09	26.64	140.00	-1.11	33.43	26.91
65.00	-1.38	33.09	26.64	141.67	-1.10	33.44	26.92
66.67	-1.40	33.09	26.64	143.34	-1.10	33.45	26.93
68.33	-1.41	33.09	26.64	145.00	-1.09	33.46	26.93
70.00	-1.43	33.10	26.65	146.67	-1.09	33.47	26.94
71.67	-1.48	33.11	26.66	148.34	-1.09	33.47	26.94
73.33	-1.60	33.12	26.67	150.00	-1.09	33.47	26.94
75.00	-1.61	33.12	26.67				

REFERENCE NO. 73-473- 19 STN- BA01 DATE 19/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 22.9
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	31.79	0	25.60	239.8	0.0	0.0	1437.
1	-1.75	31.79	1	25.60	240.1	0.02	0.00	1437.
3	-1.75	31.79	3	25.60	240.2	0.07	0.00	1437.
5	-1.75	31.79	5	25.60	240.3	0.12	0.00	1437.
7	-1.75	31.79	7	25.59	240.2	0.17	0.01	1437.
10	-1.75	31.79	10	25.60	240.2	0.24	0.01	1437.
15	-1.75	31.85	15	25.64	235.5	0.36	0.03	1437.
20	-1.75	31.98	20	25.75	225.2	0.48	0.05	1437.
30	-1.70	32.66	30	26.30	173.2	0.68	0.10	1439.
50	-1.45	32.99	50	26.57	147.7	0.99	0.23	1441.
75	-1.61	33.12	74	26.67	137.4	1.35	0.45	1440.
100	-1.52	33.19	99	26.73	131.9	1.68	0.75	1441.
125	-1.23	33.30	124	26.81	124.3	2.01	1.12	1443.

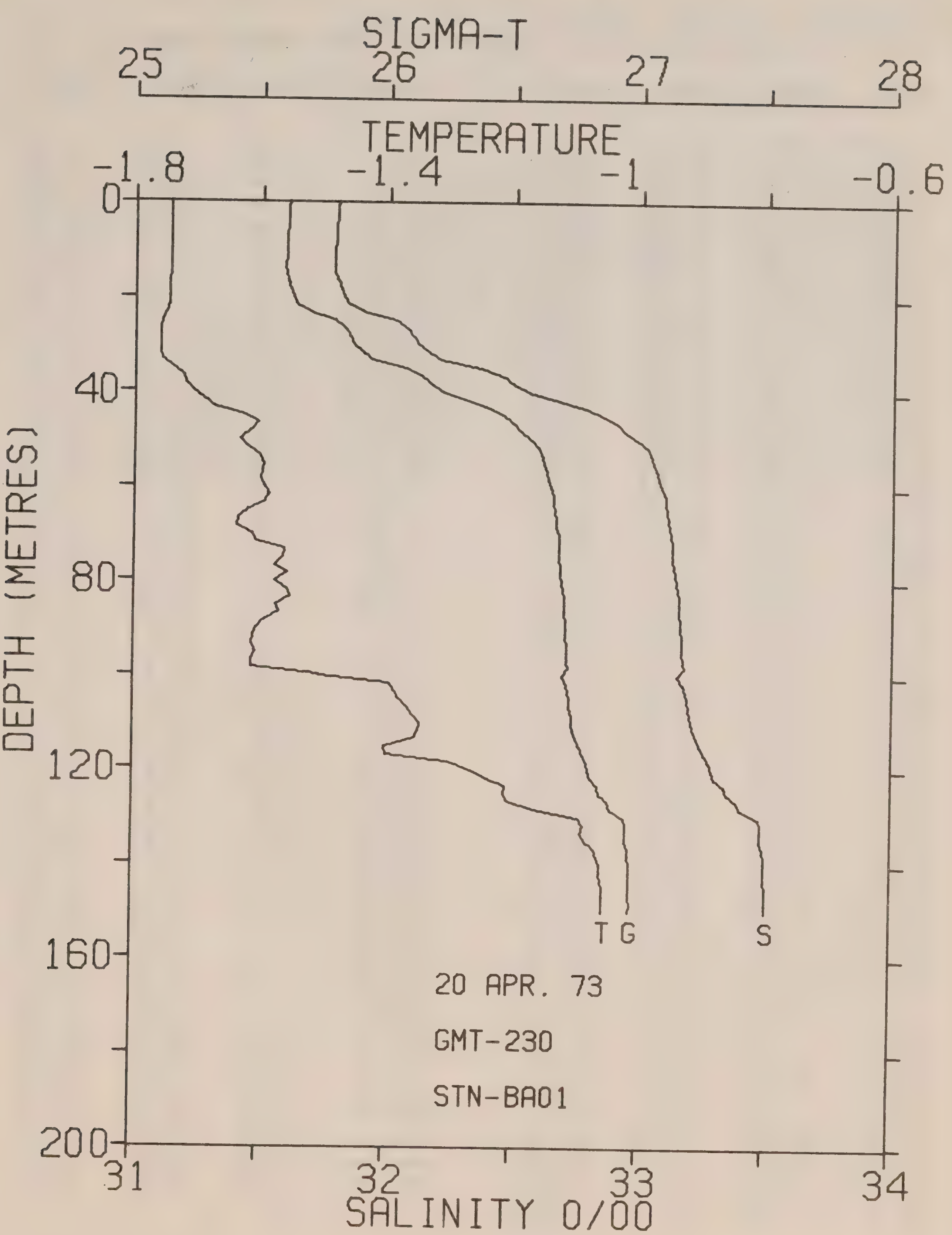

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G
S
20 APR. 73
GMT-137
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 20 STN- BA01 DATE 20/ 4/73
POSITION 74-30.0N, 91-20.0W GMT 1.6
RESULTS OF STD CAST 89 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	31.78	25.58	75.00	-1.65	33.11	26.67
1.67	-1.75	31.77	25.58	76.67	-1.66	33.12	26.67
3.33	-1.75	31.77	25.58	78.33	-1.66	33.12	26.67
5.00	-1.75	31.77	25.58	80.00	-1.65	33.12	26.68
6.67	-1.75	31.77	25.58	81.67	-1.64	33.13	26.68
8.33	-1.75	31.77	25.58	83.33	-1.61	33.13	26.68
10.00	-1.75	31.77	25.58	85.00	-1.59	33.14	26.69
11.67	-1.75	31.77	25.58	86.67	-1.57	33.15	26.69
13.33	-1.75	31.77	25.58	88.33	-1.59	33.15	26.69
15.00	-1.75	31.77	25.58	90.00	-1.60	33.15	26.70
16.67	-1.75	31.76	25.57	91.67	-1.60	33.15	26.70
18.33	-1.75	31.77	25.58	93.33	-1.59	33.15	26.70
20.00	-1.75	31.79	25.60	95.00	-1.52	33.16	26.70
21.67	-1.75	31.81	25.61	96.67	-1.57	33.17	26.71
23.33	-1.75	31.84	25.64	98.33	-1.56	33.17	26.71
25.00	-1.75	31.98	25.75	100.00	-1.59	33.17	26.71
26.67	-1.76	32.05	25.80	101.67	-1.61	33.17	26.71
28.33	-1.76	32.10	25.85	103.33	-1.57	33.17	26.71
30.00	-1.76	32.13	25.87	105.00	-1.49	33.17	26.71
31.67	-1.75	32.18	25.92	106.67	-1.46	33.17	26.71
33.33	-1.75	32.23	25.96	108.33	-1.41	33.18	26.71
35.00	-1.73	32.41	26.10	110.00	-1.44	33.18	26.72
36.67	-1.72	32.46	26.14	111.67	-1.45	33.19	26.72
38.33	-1.70	32.62	26.27	113.33	-1.44	33.20	26.73
40.00	-1.70	32.75	26.37	115.00	-1.46	33.20	26.73
41.67	-1.66	32.84	26.44	116.67	-1.48	33.22	26.75
43.33	-1.63	32.90	26.50	118.33	-1.38	33.20	26.73
45.00	-1.65	32.92	26.51	120.00	-1.28	33.22	26.74
46.67	-1.61	32.95	26.54	121.67	-1.27	33.22	26.75
48.33	-1.60	32.97	26.55	123.33	-1.27	33.23	26.75
50.00	-1.57	32.99	26.56	125.00	-1.27	33.24	26.76
51.67	-1.57	33.01	26.58	126.67	-1.25	33.26	26.77
53.33	-1.59	33.02	26.59	128.34	-1.24	33.27	26.78
55.00	-1.59	33.04	26.60	130.00	-1.21	33.31	26.81
56.67	-1.59	33.04	26.61	131.67	-1.18	33.34	26.84
58.33	-1.60	33.06	26.62	133.34	-1.13	33.41	26.89
60.00	-1.60	33.07	26.63	135.00	-1.09	33.45	26.93
61.67	-1.59	33.07	26.63	136.67	-1.08	33.47	26.94
63.33	-1.58	33.08	26.64	138.34	-1.08	33.47	26.94
65.00	-1.60	33.09	26.65	140.00	-1.07	33.48	26.95
66.67	-1.61	33.09	26.65	141.67	-1.06	33.49	26.95
68.33	-1.61	33.10	26.66	143.34	-1.06	33.49	26.95
70.00	-1.64	33.11	26.66	145.00	-1.06	33.49	26.96
71.67	-1.64	33.11	26.66	146.67	-1.06	33.49	26.96
73.33	-1.65	33.11	26.66	148.34	-1.06	33.49	26.95

REFERENCE NO. 73-473- 20   STN- BA01   DATE 20/ 4/73
POSITION 74-30.0N, 91-20.0W   GMT 1.6
RESULTS OF STD CAST   89 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	31.78	0	25.58	241.1	0.0	0.0	1437.
1	-1.75	31.77	1	25.58	241.3	0.02	0.00	1437.
3	-1.75	31.77	3	25.58	241.4	0.07	0.00	1437.
5	-1.75	31.77	5	25.58	241.4	0.12	0.00	1437.
7	-1.75	31.77	7	25.58	241.5	0.17	0.01	1437.
10	-1.75	31.77	10	25.58	241.8	0.24	0.01	1437.
15	-1.75	31.77	15	25.58	241.8	0.36	0.03	1437.
20	-1.75	31.79	20	25.60	240.0	0.48	0.05	1437.
30	-1.76	32.13	30	25.87	213.5	0.71	0.11	1438.
50	-1.57	32.99	50	26.56	148.0	1.06	0.25	1440.
75	-1.65	33.11	74	26.67	137.8	1.41	0.47	1440.
100	-1.59	33.17	99	26.71	133.3	1.75	0.77	1441.
125	-1.27	33.24	124	26.76	128.9	2.08	1.15	1443.

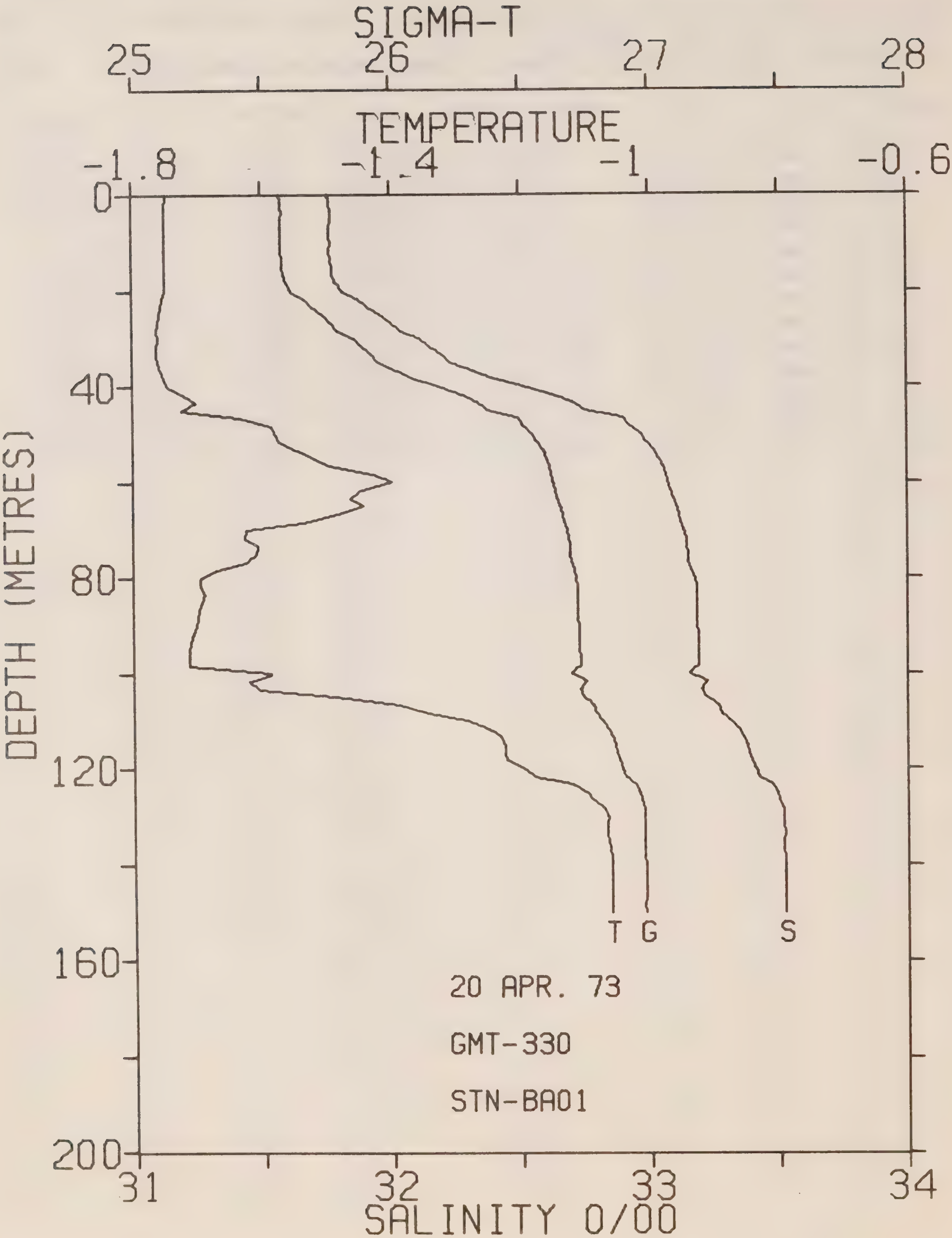

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T G
S
20 APR. 73
GMT-230
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 21   STN- BA01   DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 2.5
RESULTS OF STD CAST   90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.74	31.80	25.60	76.67	-1.58	33.13	26.68
1.67	-1.74	31.80	25.60	78.33	-1.56	33.14	26.68
3.33	-1.74	31.79	25.60	80.00	-1.58	33.14	26.69
5.00	-1.74	31.79	25.60	81.67	-1.56	33.15	26.70
6.67	-1.74	31.79	25.59	83.33	-1.55	33.15	26.70
8.33	-1.74	31.79	25.59	85.00	-1.58	33.16	26.70
10.00	-1.74	31.79	25.59	86.67	-1.57	33.16	26.70
11.67	-1.74	31.78	25.59	88.33	-1.59	33.16	26.71
13.33	-1.74	31.78	25.59	90.00	-1.61	33.16	26.71
15.00	-1.74	31.79	25.59	91.67	-1.61	33.16	26.71
16.67	-1.75	31.80	25.60	93.33	-1.61	33.17	26.71
18.33	-1.75	31.81	25.61	95.00	-1.61	33.17	26.71
20.00	-1.75	31.82	25.62	96.67	-1.61	33.17	26.71
21.67	-1.75	31.84	25.64	98.33	-1.61	33.18	26.72
23.33	-1.75	31.92	25.70	100.00	-1.51	33.15	26.69
25.00	-1.76	32.03	25.79	101.67	-1.40	33.17	26.71
26.67	-1.76	32.07	25.83	103.33	-1.39	33.19	26.72
28.33	-1.76	32.10	25.85	105.00	-1.38	33.19	26.72
30.00	-1.76	32.11	25.86	106.67	-1.37	33.19	26.72
31.67	-1.76	32.16	25.90	108.33	-1.36	33.20	26.73
33.33	-1.76	32.21	25.93	110.00	-1.35	33.21	26.73
35.00	-1.74	32.37	26.06	111.67	-1.35	33.21	26.74
36.67	-1.72	32.46	26.14	113.33	-1.35	33.23	26.75
38.33	-1.72	32.49	26.17	115.00	-1.40	33.24	26.77
40.00	-1.71	32.56	26.22	116.67	-1.40	33.26	26.78
41.67	-1.69	32.67	26.31	118.33	-1.30	33.28	26.79
43.33	-1.67	32.78	26.40	120.00	-1.26	33.29	26.80
45.00	-1.63	32.86	26.46	121.67	-1.24	33.30	26.81
46.67	-1.61	32.90	26.50	123.33	-1.21	33.34	26.84
48.33	-1.62	32.94	26.53	125.00	-1.21	33.35	26.85
50.00	-1.63	32.99	26.57	126.67	-1.21	33.39	26.88
51.67	-1.62	33.03	26.60	128.34	-1.16	33.41	26.89
53.33	-1.60	33.04	26.61	130.00	-1.10	33.48	26.95
55.00	-1.60	33.05	26.62	131.67	-1.09	33.48	26.95
56.67	-1.60	33.07	26.63	133.34	-1.09	33.48	26.95
58.33	-1.60	33.07	26.63	135.00	-1.08	33.48	26.95
60.00	-1.60	33.09	26.64	136.67	-1.07	33.49	26.96
61.67	-1.59	33.10	26.65	138.34	-1.06	33.50	26.96
63.33	-1.60	33.10	26.66	140.00	-1.06	33.50	26.96
65.00	-1.62	33.11	26.66	141.67	-1.06	33.50	26.97
66.67	-1.64	33.11	26.67	143.34	-1.06	33.50	26.96
68.33	-1.64	33.12	26.67	145.00	-1.06	33.50	26.97
70.00	-1.61	33.12	26.68	146.67	-1.06	33.51	26.97
71.67	-1.61	33.13	26.68	148.34	-1.06	33.51	26.97
73.33	-1.56	33.13	26.68	150.00	-1.06	33.51	26.97
75.00	-1.56	33.13	26.68				

REFERENCE NO. 73-473- 21 STN- BA01 DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 2.5
RESULTS OF STD CAST 90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.74	31.80	0	25.60	239.4	0.0	0.0	1437.
1	-1.74	31.80	1	25.60	239.6	0.02	0.00	1437.
3	-1.74	31.79	3	25.60	239.9	0.07	0.00	1437.
5	-1.74	31.79	5	25.60	240.0	0.12	0.00	1437.
7	-1.74	31.79	7	25.59	240.3	0.17	0.01	1437.
10	-1.74	31.79	10	25.59	240.4	0.24	0.01	1437.
15	-1.74	31.79	15	25.59	240.3	0.36	0.03	1437.
20	-1.75	31.82	20	25.62	237.4	0.48	0.05	1437.
30	-1.76	32.11	30	25.86	214.9	0.70	0.11	1438.
50	-1.63	32.99	50	26.57	147.6	1.06	0.25	1440.
75	-1.56	33.13	74	26.68	136.9	1.41	0.47	1441.
100	-1.51	33.15	99	26.69	135.3	1.75	0.77	1441.
125	-1.21	33.35	124	26.85	120.8	2.07	1.14	1443.

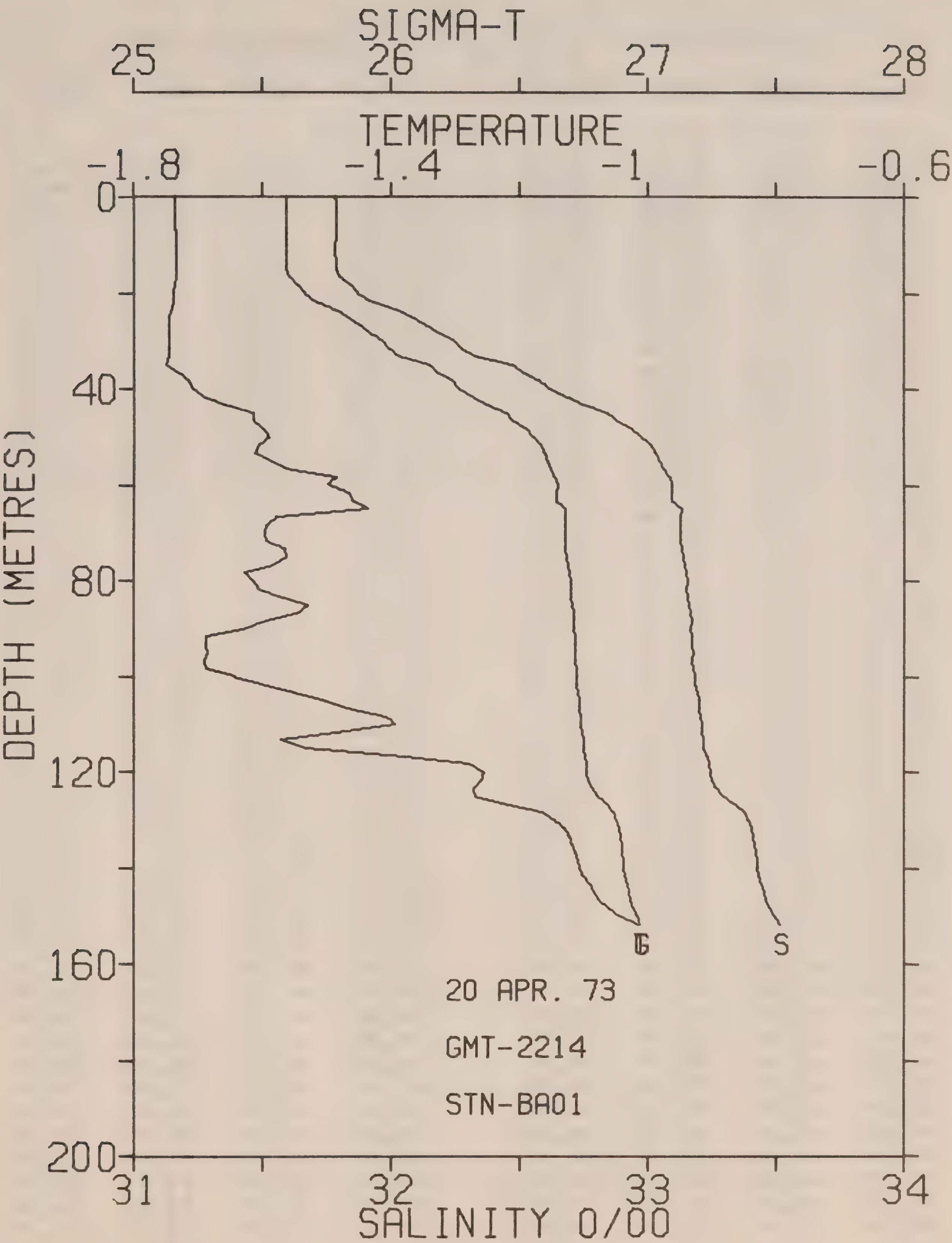

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T G S
20 APR. 73
GMT-330
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 22   STN- BA01   DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 3.5
RESULTS OF STD CAST   91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	31.76	25.57	76.67	-1.62	33.15	26.70
1.67	-1.75	31.77	25.58	78.33	-1.67	33.16	26.71
3.33	-1.75	31.77	25.58	80.00	-1.70	33.18	26.72
5.00	-1.75	31.77	25.58	81.67	-1.70	33.18	26.72
6.67	-1.75	31.77	25.58	83.33	-1.69	33.18	26.72
8.33	-1.75	31.77	25.58	85.00	-1.69	33.18	26.72
10.00	-1.75	31.77	25.58	86.67	-1.70	33.18	26.72
11.67	-1.75	31.77	25.58	88.33	-1.70	33.18	26.72
13.33	-1.75	31.77	25.58	90.00	-1.70	33.19	26.73
15.00	-1.75	31.78	25.59	91.67	-1.71	33.19	26.73
16.67	-1.75	31.78	25.59	93.33	-1.71	33.19	26.73
18.33	-1.75	31.79	25.60	95.00	-1.71	33.19	26.73
20.00	-1.75	31.81	25.62	96.67	-1.71	33.19	26.73
21.67	-1.75	31.88	25.67	98.33	-1.71	33.19	26.73
23.33	-1.75	31.92	25.70	100.00	-1.59	33.15	26.70
25.00	-1.76	31.96	25.74	101.67	-1.62	33.22	26.75
26.67	-1.76	32.01	25.77	103.33	-1.61	33.20	26.74
28.33	-1.76	32.04	25.80	105.00	-1.49	33.22	26.75
30.00	-1.76	32.11	25.86	106.67	-1.39	33.26	26.78
31.67	-1.76	32.15	25.89	108.33	-1.34	33.28	26.79
33.33	-1.76	32.20	25.93	110.00	-1.28	33.31	26.82
35.00	-1.76	32.23	25.95	111.67	-1.25	33.34	26.84
36.67	-1.75	32.32	26.03	113.33	-1.23	33.36	26.86
38.33	-1.75	32.39	26.09	115.00	-1.22	33.38	26.87
40.00	-1.74	32.52	26.19	116.67	-1.22	33.38	26.87
41.67	-1.72	32.63	26.28	118.33	-1.22	33.39	26.88
43.33	-1.70	32.71	26.34	120.00	-1.20	33.41	26.90
45.00	-1.72	32.76	26.38	121.67	-1.18	33.42	26.90
46.67	-1.63	32.90	26.50	123.33	-1.12	33.47	26.94
48.33	-1.58	32.93	26.52	125.00	-1.10	33.50	26.96
50.00	-1.58	32.97	26.55	126.67	-1.09	33.50	26.97
51.67	-1.57	32.99	26.57	128.34	-1.07	33.52	26.98
53.33	-1.54	33.02	26.59	130.00	-1.07	33.52	26.98
55.00	-1.52	33.04	26.61	131.67	-1.07	33.52	26.98
56.67	-1.49	33.06	26.62	133.34	-1.07	33.52	26.98
58.33	-1.43	33.06	26.62	135.00	-1.07	33.52	26.98
60.00	-1.40	33.07	26.63	136.67	-1.06	33.52	26.98
61.67	-1.44	33.08	26.64	138.34	-1.06	33.52	26.98
63.33	-1.46	33.09	26.65	140.00	-1.06	33.52	26.98
65.00	-1.44	33.11	26.66	141.67	-1.06	33.52	26.98
66.67	-1.48	33.12	26.67	143.34	-1.06	33.52	26.98
68.33	-1.54	33.12	26.67	145.00	-1.06	33.52	26.98
70.00	-1.63	33.13	26.68	146.67	-1.06	33.52	26.98
71.67	-1.63	33.14	26.69	148.34	-1.06	33.52	26.98
73.33	-1.61	33.15	26.69	150.00	-1.06	33.52	26.98
75.00	-1.61	33.15	26.70				

REFERENCE NO. 73-473- 22   STN- BA01   DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 3.5
RESULTS OF STD CAST   91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	31.76	0	25.57	242.1	0.0	0.0	1437.
1	-1.75	31.77	1	25.58	242.0	0.02	0.00	1437.
3	-1.75	31.77	3	25.58	241.6	0.07	0.00	1437.
5	-1.75	31.77	5	25.58	241.7	0.12	0.00	1437.
7	-1.75	31.77	7	25.58	241.8	0.17	0.01	1437.
10	-1.75	31.77	10	25.58	241.7	0.24	0.01	1437.
15	-1.75	31.78	15	25.59	241.1	0.36	0.03	1437.
20	-1.75	31.81	20	25.62	238.1	0.48	0.05	1437.
30	-1.76	32.11	30	25.86	214.9	0.71	0.11	1438.
50	-1.58	32.97	50	26.55	149.2	1.08	0.25	1440.
75	-1.61	33.15	74	26.70	135.2	1.43	0.48	1440.
100	-1.59	33.15	99	26.70	134.8	1.76	0.77	1441.
125	-1.10	33.50	124	26.96	109.8	2.06	1.12	1444.

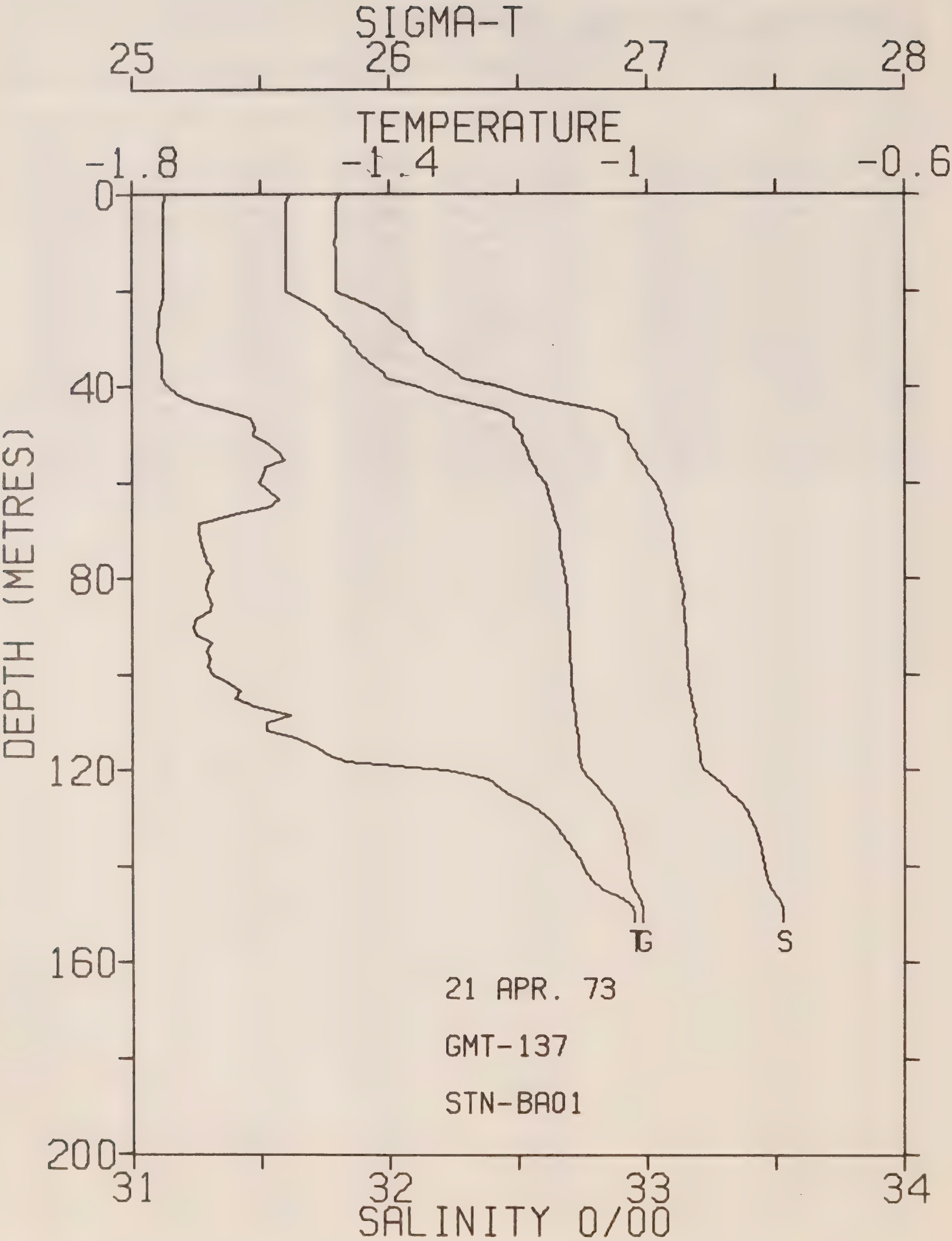

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T
S
20 APR. 73
GMT-2214
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 23 STN- BA01 DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 22.2
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.73	31.79	25.59	76.67	-1.59	33.15	26.69
1.67	-1.73	31.79	25.59	78.33	-1.63	33.15	26.70
3.33	-1.73	31.79	25.59	80.00	-1.61	33.15	26.70
5.00	-1.73	31.79	25.60	81.67	-1.61	33.15	26.70
6.67	-1.73	31.79	25.59	83.33	-1.57	33.16	26.70
8.33	-1.73	31.79	25.59	85.00	-1.53	33.16	26.70
10.00	-1.73	31.79	25.59	86.67	-1.54	33.17	26.71
11.67	-1.73	31.78	25.59	88.33	-1.59	33.17	26.71
13.33	-1.73	31.79	25.59	90.00	-1.63	33.17	26.71
15.00	-1.73	31.79	25.60	91.67	-1.69	33.17	26.72
16.67	-1.73	31.80	25.60	93.33	-1.69	33.17	26.72
18.33	-1.73	31.84	25.64	95.00	-1.68	33.18	26.72
20.00	-1.74	31.87	25.67	96.67	-1.69	33.17	26.72
21.67	-1.74	31.91	25.70	98.33	-1.69	33.18	26.72
23.33	-1.74	32.02	25.78	100.00	-1.64	33.18	26.72
25.00	-1.74	32.08	25.83	101.67	-1.60	33.18	26.72
26.67	-1.74	32.14	25.88	103.33	-1.55	33.19	26.73
28.33	-1.74	32.19	25.92	105.00	-1.51	33.20	26.73
30.00	-1.74	32.25	25.97	106.67	-1.47	33.20	26.73
31.67	-1.74	32.28	25.99	108.33	-1.41	33.21	26.74
33.33	-1.74	32.33	26.03	110.00	-1.39	33.21	26.74
35.00	-1.75	32.47	26.15	111.67	-1.49	33.21	26.74
36.67	-1.73	32.51	26.18	113.33	-1.57	33.21	26.75
38.33	-1.71	32.58	26.24	115.00	-1.53	33.22	26.75
40.00	-1.71	32.61	26.26	116.67	-1.38	33.23	26.76
41.67	-1.69	32.69	26.32	118.33	-1.28	33.24	26.76
43.33	-1.66	32.75	26.37	120.00	-1.26	33.24	26.76
45.00	-1.61	32.85	26.45	121.67	-1.26	33.25	26.77
46.67	-1.61	32.88	26.47	123.33	-1.27	33.27	26.78
48.33	-1.60	32.94	26.53	125.00	-1.27	33.30	26.81
50.00	-1.59	32.98	26.55	126.67	-1.23	33.34	26.84
51.67	-1.61	33.01	26.58	128.34	-1.17	33.38	26.87
53.33	-1.61	33.03	26.60	130.00	-1.14	33.39	26.88
55.00	-1.59	33.05	26.61	131.67	-1.13	33.40	26.89
56.67	-1.56	33.06	26.62	133.34	-1.12	33.41	26.89
58.33	-1.49	33.09	26.64	135.00	-1.12	33.42	26.90
60.00	-1.50	33.09	26.65	136.67	-1.11	33.42	26.90
61.67	-1.46	33.09	26.65	138.34	-1.11	33.43	26.91
63.33	-1.46	33.09	26.65	140.00	-1.11	33.43	26.91
65.00	-1.43	33.14	26.68	141.67	-1.10	33.43	26.91
66.67	-1.58	33.13	26.68	143.34	-1.09	33.45	26.92
68.33	-1.59	33.13	26.68	145.00	-1.09	33.45	26.93
70.00	-1.60	33.13	26.68	146.67	-1.08	33.46	26.93
71.67	-1.59	33.13	26.68	148.34	-1.06	33.48	26.94
73.33	-1.56	33.13	26.68	150.00	-1.04	33.50	26.96
75.00	-1.56	33.14	26.68	151.67	-1.01	33.51	26.97

REFERENCE NO. 73-473- 23   STN- BA01   DATE 20/ 4/73
POSITION 74-30.0N, 91-21.0W   GMT 22.2
RESULTS OF STD CAST   92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.73	31.79	0	25.59	240.4	0.0	0.0	1437.
1	-1.73	31.79	1	25.59	240.4	0.02	0.00	1437.
3	-1.73	31.79	3	25.59	240.4	0.07	0.00	1437.
5	-1.73	31.79	5	25.60	240.3	0.12	0.00	1437.
7	-1.73	31.79	7	25.59	240.3	0.17	0.01	1437.
10	-1.73	31.79	10	25.59	240.4	0.24	0.01	1437.
15	-1.73	31.79	15	25.60	240.1	0.36	0.03	1437.
20	-1.74	31.87	20	25.67	233.5	0.48	0.05	1437.
30	-1.74	32.25	30	25.97	204.7	0.70	0.10	1438.
50	-1.59	32.98	50	26.55	148.9	1.05	0.24	1440.
75	-1.56	33.14	74	26.68	136.3	1.40	0.47	1441.
100	-1.64	33.18	99	26.72	132.5	1.73	0.77	1441.
125	-1.27	33.30	124	26.81	124.6	2.06	1.14	1443.
150	-1.04	33.50	149	26.96	109.9	2.35	1.54	1445.



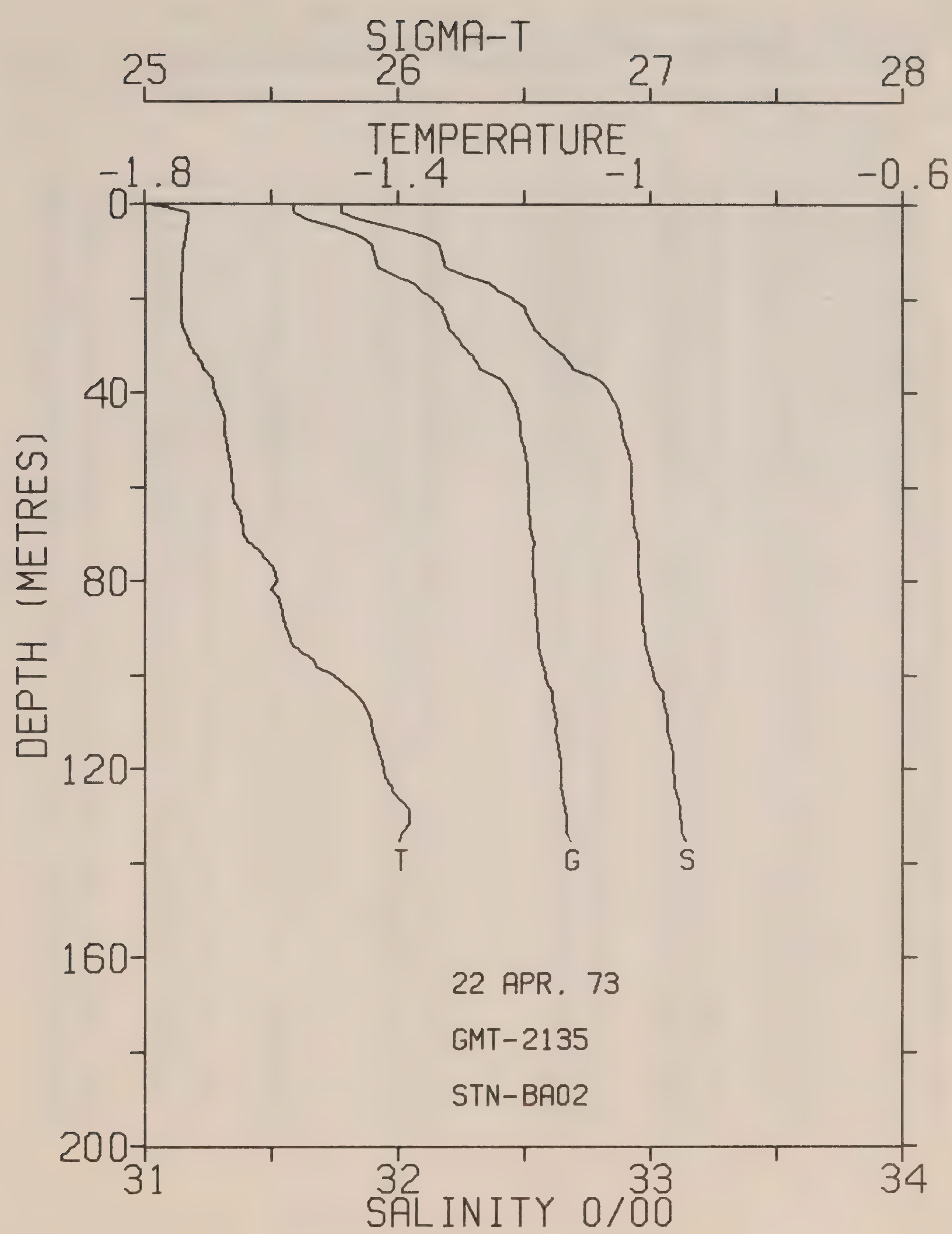
SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T
G
S
21 APR. 73
GMT-137
STN-BA01
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 24 STN- BA01 DATE 21/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 1.6
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	31.81	25.62	76.67	-1.68	33.12	26.67
1.67	-1.75	31.79	25.60	78.33	-1.67	33.12	26.68
3.33	-1.75	31.80	25.60	80.00	-1.68	33.13	26.68
5.00	-1.75	31.79	25.60	81.67	-1.69	33.14	26.69
6.67	-1.75	31.79	25.60	83.33	-1.68	33.14	26.69
8.33	-1.75	31.79	25.60	85.00	-1.68	33.14	26.69
10.00	-1.75	31.79	25.60	86.67	-1.68	33.14	26.69
11.67	-1.75	31.79	25.60	88.33	-1.70	33.15	26.69
13.33	-1.75	31.79	25.60	90.00	-1.71	33.15	26.70
15.00	-1.75	31.79	25.60	91.67	-1.70	33.15	26.70
16.67	-1.75	31.79	25.60	93.33	-1.68	33.15	26.70
18.33	-1.75	31.80	25.60	95.00	-1.68	33.15	26.70
20.00	-1.75	31.80	25.60	96.67	-1.68	33.16	26.70
21.67	-1.75	31.86	25.65	98.33	-1.68	33.16	26.70
23.33	-1.75	31.94	25.72	100.00	-1.67	33.16	26.71
25.00	-1.76	31.98	25.75	101.67	-1.65	33.16	26.71
26.67	-1.76	32.02	25.78	103.33	-1.63	33.17	26.71
28.33	-1.76	32.06	25.82	105.00	-1.64	33.17	26.71
30.00	-1.76	32.09	25.84	106.67	-1.61	33.18	26.72
31.67	-1.76	32.12	25.86	108.33	-1.55	33.19	26.72
33.33	-1.75	32.15	25.89	110.00	-1.59	33.18	26.72
35.00	-1.75	32.20	25.93	111.67	-1.59	33.19	26.73
36.67	-1.75	32.25	25.97	113.33	-1.55	33.20	26.73
38.33	-1.75	32.28	26.00	115.00	-1.52	33.20	26.73
40.00	-1.74	32.43	26.12	116.67	-1.50	33.20	26.74
41.67	-1.73	32.53	26.19	118.33	-1.47	33.20	26.74
43.33	-1.70	32.66	26.30	120.00	-1.31	33.22	26.75
45.00	-1.65	32.83	26.44	121.67	-1.25	33.26	26.78
46.67	-1.62	32.89	26.48	123.33	-1.23	33.30	26.81
48.33	-1.61	32.89	26.49	125.00	-1.21	33.33	26.83
50.00	-1.61	32.93	26.52	126.67	-1.19	33.36	26.86
51.67	-1.59	32.93	26.52	128.34	-1.17	33.39	26.88
53.33	-1.57	32.95	26.54	130.00	-1.15	33.40	26.89
55.00	-1.56	32.97	26.55	131.67	-1.14	33.42	26.90
56.67	-1.59	32.99	26.57	133.34	-1.13	33.43	26.91
58.33	-1.60	33.01	26.58	135.00	-1.12	33.44	26.92
60.00	-1.60	33.04	26.60	136.67	-1.12	33.44	26.92
61.67	-1.59	33.05	26.61	138.34	-1.10	33.45	26.93
63.33	-1.57	33.06	26.62	140.00	-1.10	33.45	26.93
65.00	-1.59	33.07	26.63	141.67	-1.09	33.46	26.93
66.67	-1.65	33.08	26.64	143.34	-1.08	33.47	26.94
68.33	-1.70	33.09	26.65	145.00	-1.07	33.48	26.95
70.00	-1.70	33.10	26.66	146.67	-1.04	33.51	26.97
71.67	-1.69	33.10	26.66	148.34	-1.02	33.53	26.98
73.33	-1.69	33.11	26.66	150.00	-1.02	33.53	26.98
75.00	-1.69	33.11	26.67				

REFERENCE NO. 73-473- 24 STN- BA01 DATE 21/ 4/73
POSITION 74-30.0N, 91-21.0W GMT 1.6
RESULTS OF STD CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	31.81	0	25.62	238.2	0.0	0.0	1437.
1	-1.75	31.80	1	25.61	239.3	0.02	0.00	1437.
3	-1.75	31.80	3	25.60	239.7	0.07	0.00	1437.
5	-1.75	31.79	5	25.60	239.8	0.12	0.00	1437.
7	-1.75	31.79	7	25.60	239.9	0.17	0.01	1437.
10	-1.75	31.79	10	25.60	239.9	0.24	0.01	1437.
15	-1.75	31.79	15	25.60	239.9	0.36	0.03	1437.
20	-1.75	31.80	20	25.60	239.6	0.48	0.05	1437.
30	-1.76	32.09	30	25.84	217.1	0.71	0.11	1437.
50	-1.61	32.93	50	26.52	152.5	1.08	0.26	1440.
75	-1.69	33.11	74	26.67	137.9	1.44	0.48	1440.
100	-1.67	33.16	99	26.71	134.0	1.78	0.78	1441.
125	-1.21	33.33	124	26.83	122.4	2.11	1.16	1443.
150	-1.02	33.53	149	26.98	107.6	2.39	1.56	1445.

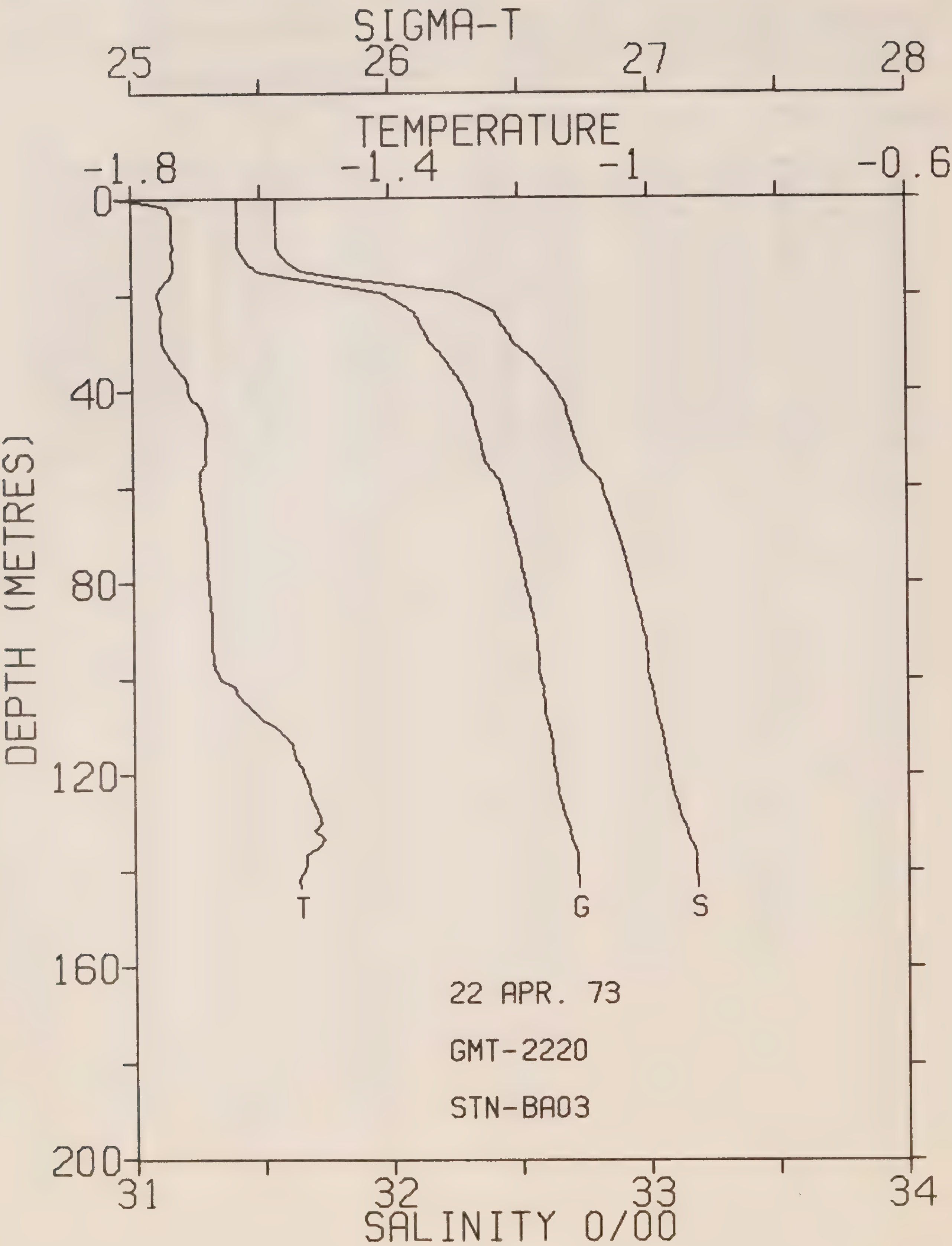

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T
G
S
22 APR. 73
GMT-2135
STN-BA02
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 25 STN- BA02 DATE 22/ 4/73
POSITION 74-33.0N, 94-19.0W GMT 21.6
RESULTS OF STD CAST 82 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.79	31.78	25.59	68.33	-1.64	32.94	26.52
1.67	-1.73	31.78	25.59	70.00	-1.64	32.94	26.53
3.33	-1.73	31.85	25.65	71.67	-1.63	32.95	26.54
5.00	-1.73	32.00	25.76	73.33	-1.62	32.95	26.54
6.67	-1.74	32.11	25.86	75.00	-1.61	32.95	26.53
8.33	-1.74	32.16	25.90	76.67	-1.60	32.95	26.53
10.00	-1.74	32.17	25.90	78.33	-1.59	32.95	26.54
11.67	-1.74	32.18	25.91	80.00	-1.59	32.95	26.54
13.33	-1.74	32.19	25.92	81.67	-1.60	32.96	26.54
15.00	-1.74	32.27	25.99	83.33	-1.59	32.96	26.55
16.67	-1.74	32.36	26.06	85.00	-1.59	32.97	26.55
18.33	-1.74	32.40	26.09	86.67	-1.58	32.97	26.55
20.00	-1.74	32.46	26.14	88.33	-1.58	32.97	26.55
21.67	-1.74	32.50	26.17	90.00	-1.58	32.97	26.55
23.33	-1.74	32.51	26.18	91.67	-1.57	32.98	26.55
25.00	-1.74	32.53	26.19	93.33	-1.57	32.98	26.56
26.67	-1.74	32.54	26.21	95.00	-1.55	32.99	26.56
28.33	-1.73	32.58	26.24	96.67	-1.53	32.99	26.57
30.00	-1.73	32.60	26.26	98.33	-1.53	33.00	26.58
31.67	-1.72	32.65	26.29	100.00	-1.50	33.01	26.58
33.33	-1.71	32.67	26.31	101.67	-1.49	33.02	26.59
35.00	-1.71	32.69	26.33	103.33	-1.47	33.05	26.61
36.67	-1.69	32.78	26.40	105.00	-1.46	33.05	26.61
38.33	-1.69	32.82	26.43	106.67	-1.45	33.06	26.62
40.00	-1.69	32.84	26.45	108.33	-1.44	33.07	26.62
41.67	-1.68	32.86	26.46	110.00	-1.44	33.07	26.63
43.33	-1.68	32.87	26.47	111.67	-1.44	33.07	26.62
45.00	-1.67	32.88	26.48	113.33	-1.44	33.07	26.63
46.67	-1.67	32.89	26.48	115.00	-1.43	33.08	26.64
48.33	-1.67	32.89	26.48	116.67	-1.43	33.09	26.64
50.00	-1.67	32.90	26.49	118.33	-1.42	33.09	26.64
51.67	-1.67	32.90	26.50	120.00	-1.42	33.09	26.64
53.33	-1.67	32.92	26.51	121.67	-1.42	33.09	26.64
55.00	-1.66	32.92	26.51	123.33	-1.41	33.10	26.65
56.67	-1.66	32.92	26.51	125.00	-1.41	33.10	26.65
58.33	-1.66	32.92	26.51	126.67	-1.40	33.11	26.66
60.00	-1.66	32.92	26.51	128.34	-1.38	33.12	26.66
61.67	-1.66	32.92	26.51	130.00	-1.38	33.12	26.67
63.33	-1.66	32.93	26.52	131.67	-1.38	33.12	26.67
65.00	-1.65	32.93	26.52	133.34	-1.39	33.12	26.67
66.67	-1.65	32.93	26.52	135.00	-1.40	33.14	26.68

REFERENCE NO. 73-473- 25 STN- BA02 DATE 22/ 4/73
POSITION 74-33.0N, 94-19.0W GMT 21.6
RESULTS OF STD CAST 82 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.79	31.78	0	25.59	240.9	0.0	0.0	1436.
1	-1.76	31.78	1	25.59	241.1	0.02	0.00	1437.
3	-1.73	31.84	3	25.64	236.5	0.07	0.00	1437.
5	-1.73	32.00	5	25.76	224.2	0.12	0.00	1437.
7	-1.74	32.12	7	25.86	214.8	0.16	0.01	1437.
10	-1.74	32.17	10	25.90	210.8	0.23	0.01	1437.
15	-1.74	32.27	15	25.99	202.9	0.33	0.02	1438.
20	-1.74	32.46	20	26.14	188.6	0.43	0.04	1438.
30	-1.73	32.60	30	26.26	177.3	0.61	0.09	1438.
50	-1.67	32.90	50	26.49	154.8	0.93	0.22	1439.
75	-1.61	32.95	74	26.53	150.5	1.32	0.46	1440.
100	-1.50	33.01	99	26.58	145.9	1.69	0.79	1441.
125	-1.41	33.10	124	26.65	139.2	2.04	1.20	1442.

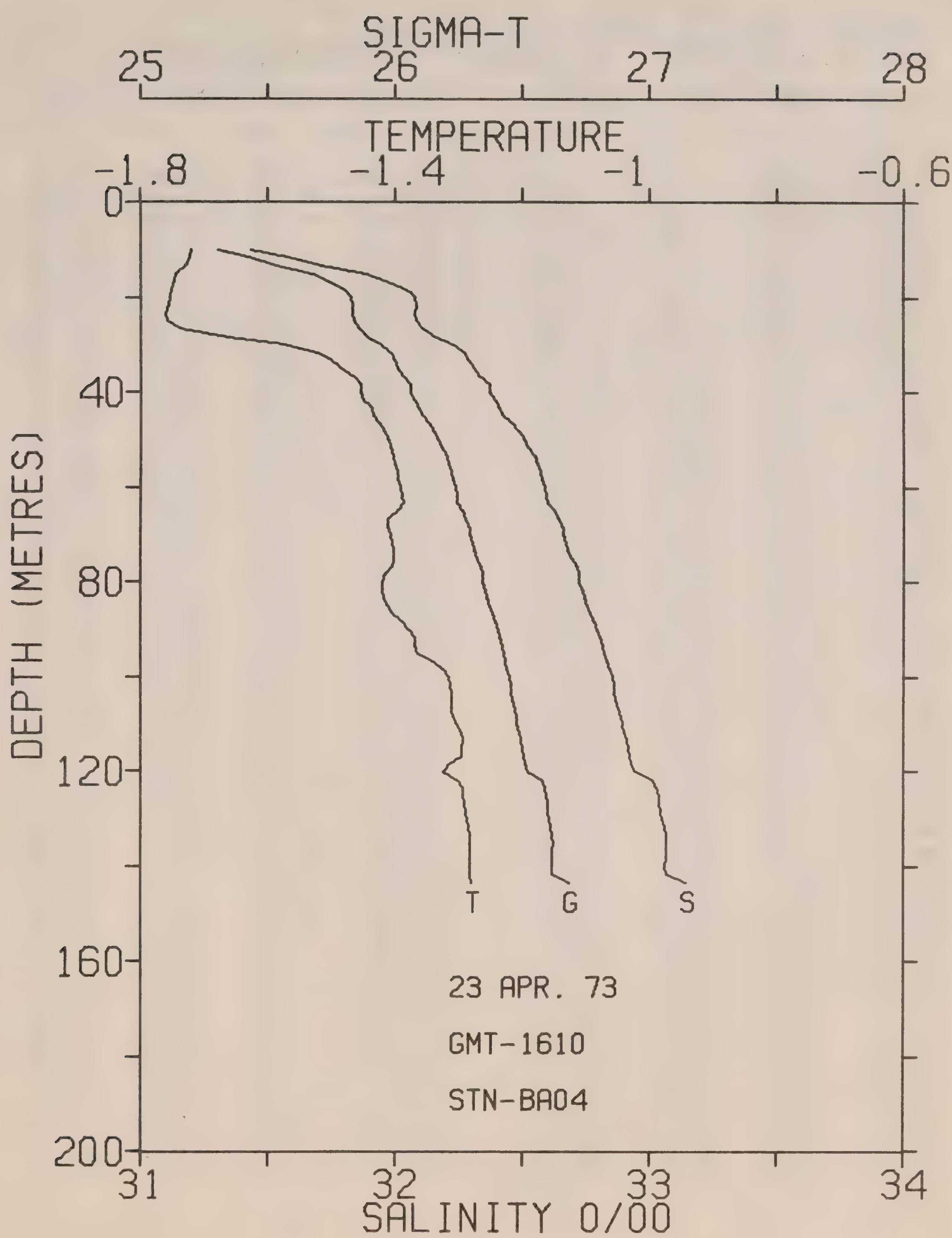

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
G
S
22 APR. 73
GMT-2220
STN-BA03
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 26   STN- BA03   DATE 22/ 4/73
POSITION 74-28.0N, 94-19.0W   GMT 22.3
RESULTS OF STD CAST   87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.83	31.56	25.41	73.33	-1.68	32.90	26.50
1.67	-1.74	31.56	25.41	75.00	-1.68	32.91	26.50
3.33	-1.74	31.56	25.41	76.67	-1.68	32.91	26.51
5.00	-1.74	31.56	25.41	78.33	-1.68	32.93	26.52
6.67	-1.74	31.56	25.41	80.00	-1.68	32.94	26.52
8.33	-1.74	31.56	25.41	81.67	-1.68	32.94	26.53
10.00	-1.74	31.56	25.41	83.33	-1.68	32.95	26.54
11.67	-1.74	31.58	25.43	85.00	-1.68	32.96	26.54
13.33	-1.74	31.61	25.45	86.67	-1.68	32.97	26.55
15.00	-1.74	31.66	25.49	88.33	-1.68	32.97	26.56
16.67	-1.74	31.83	25.63	90.00	-1.68	32.98	26.56
18.33	-1.76	32.09	25.84	91.67	-1.68	32.99	26.57
20.00	-1.76	32.27	25.99	93.33	-1.68	32.99	26.57
21.67	-1.76	32.34	26.04	95.00	-1.68	32.99	26.57
23.33	-1.75	32.40	26.09	96.67	-1.67	32.99	26.57
25.00	-1.75	32.42	26.11	98.33	-1.67	33.00	26.57
26.67	-1.75	32.44	26.12	100.00	-1.66	33.00	26.58
28.33	-1.75	32.47	26.15	101.67	-1.64	33.01	26.59
30.00	-1.75	32.48	26.15	103.33	-1.64	33.02	26.59
31.67	-1.75	32.52	26.19	105.00	-1.63	33.02	26.59
33.33	-1.74	32.55	26.21	106.67	-1.61	33.03	26.60
35.00	-1.73	32.58	26.24	108.33	-1.60	33.04	26.60
36.67	-1.72	32.60	26.26	110.00	-1.58	33.04	26.61
38.33	-1.71	32.63	26.28	111.67	-1.57	33.05	26.62
40.00	-1.71	32.65	26.29	113.33	-1.55	33.06	26.62
41.67	-1.71	32.67	26.31	115.00	-1.55	33.06	26.62
43.33	-1.69	32.69	26.32	116.67	-1.55	33.06	26.63
45.00	-1.69	32.68	26.32	118.33	-1.54	33.07	26.63
46.67	-1.68	32.70	26.33	120.00	-1.53	33.08	26.64
48.33	-1.68	32.70	26.34	121.67	-1.53	33.08	26.64
50.00	-1.69	32.72	26.35	123.33	-1.53	33.09	26.64
51.67	-1.69	32.73	26.36	125.00	-1.52	33.10	26.65
53.33	-1.69	32.74	26.36	126.67	-1.52	33.11	26.66
55.00	-1.69	32.75	26.37	128.34	-1.51	33.12	26.67
56.67	-1.70	32.78	26.39	130.00	-1.51	33.14	26.68
58.33	-1.70	32.81	26.42	131.67	-1.52	33.15	26.69
60.00	-1.70	32.82	26.43	133.34	-1.50	33.15	26.70
61.67	-1.69	32.83	26.44	135.00	-1.52	33.17	26.71
63.33	-1.69	32.84	26.45	136.67	-1.53	33.18	26.71
65.00	-1.69	32.85	26.45	138.34	-1.53	33.18	26.72
66.67	-1.69	32.86	26.46	140.00	-1.54	33.18	26.72
68.33	-1.69	32.87	26.47	141.67	-1.54	33.18	26.72
70.00	-1.69	32.88	26.48	143.34	-1.54	33.18	26.72
71.67	-1.69	32.89	26.49				

REFERENCE NO. 73-473- 26   STN- BA03   DATE 22/ 4/73
POSITION 74-28.0N, 94-19.0W   GMT 22.3
RESULTS OF STD CAST   87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.83	31.56	0	25.41	257.5	0.0	0.0	1436.
1	-1.78	31.56	1	25.41	257.6	0.03	0.00	1436.
3	-1.74	31.56	3	25.41	257.6	0.08	0.00	1436.
5	-1.74	31.56	5	25.41	257.7	0.13	0.00	1436.
7	-1.74	31.56	7	25.41	257.7	0.18	0.01	1436.
10	-1.74	31.56	10	25.41	257.9	0.26	0.01	1437.
15	-1.74	31.66	15	25.49	250.0	0.39	0.03	1437.
20	-1.76	32.27	20	25.99	202.9	0.50	0.05	1438.
30	-1.75	32.48	30	26.15	186.9	0.69	0.10	1438.
50	-1.69	32.72	50	26.35	168.3	1.04	0.24	1439.
75	-1.68	32.91	74	26.50	153.5	1.44	0.49	1440.
100	-1.66	33.00	99	26.58	146.2	1.81	0.83	1440.
125	-1.52	33.10	124	26.65	139.1	2.17	1.23	1442.

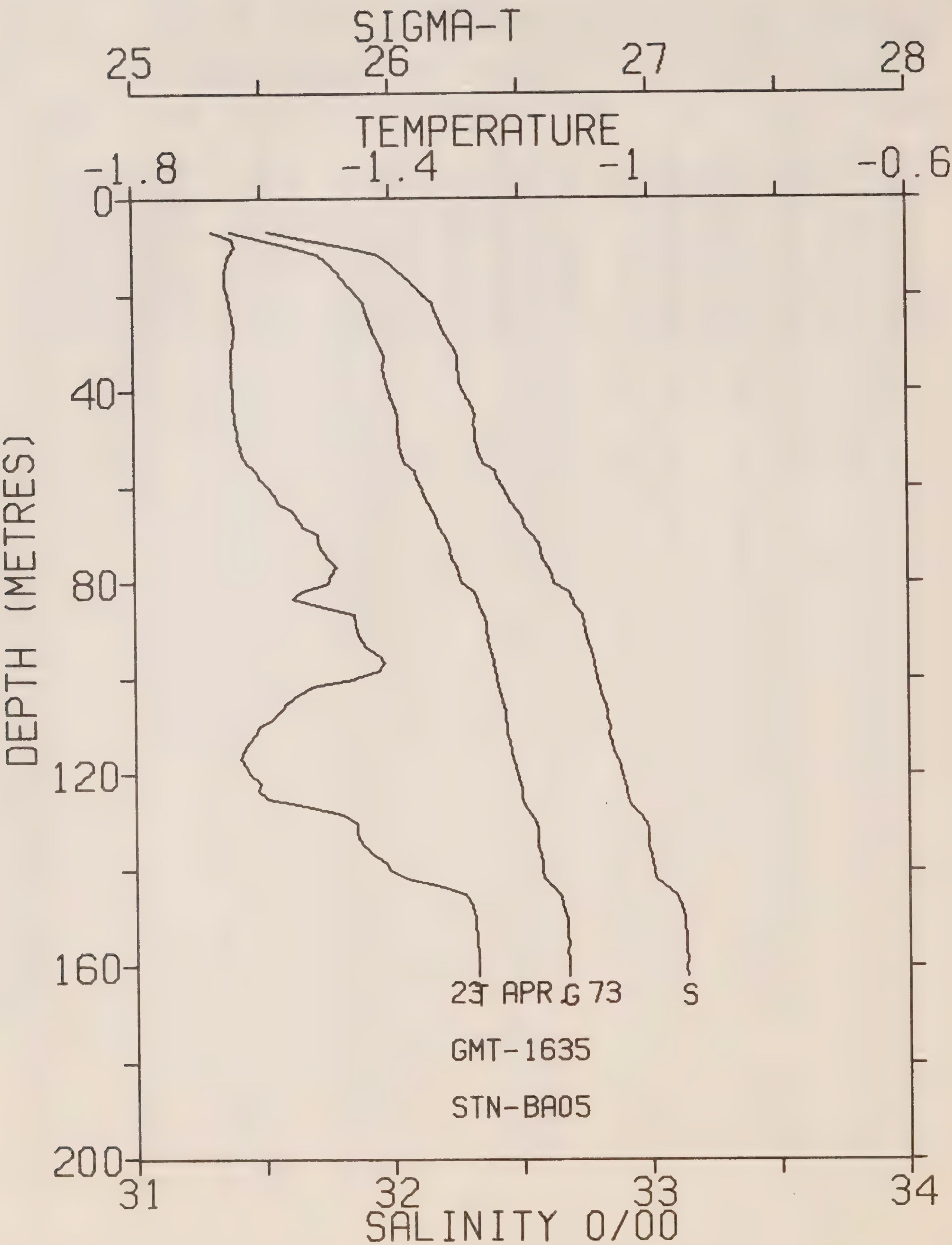

SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
T
G
S
23 APR. 73
GMT-1610
STN-BA04
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 27 STN- BA04 DATE 23/ 4/73
POSITION 74-23.0N, 94-19.0W GMT 16.2
RESULTS OF STD CAST 87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL.	SIGMA T
0.0	-1.81		
1.67	-1.72		
3.33	-1.72		
5.00	-1.72	off scale	
6.67	-1.72		
8.33	-1.72		
10.00	-1.72	31.44	25.31
11.67	-1.72	31.58	25.43
13.33	-1.73	31.71	25.53
15.00	-1.74	31.89	25.68
16.67	-1.75	31.96	25.74
18.33	-1.75	32.04	25.80
20.00	-1.75	32.08	25.83
21.67	-1.76	32.08	25.83
23.33	-1.76	32.08	25.83
25.00	-1.76	32.09	25.84
26.67	-1.73	32.11	25.86
28.33	-1.66	32.16	25.90
30.00	-1.57	32.23	25.95
31.67	-1.52	32.27	25.98
33.33	-1.50	32.29	26.00
35.00	-1.49	32.31	26.01
36.67	-1.46	32.33	26.03
38.33	-1.45	32.37	26.06
40.00	-1.45	32.37	26.06
41.67	-1.45	32.39	26.08
43.33	-1.44	32.41	26.09
45.00	-1.43	32.43	26.11
46.67	-1.42	32.46	26.14
48.33	-1.42	32.49	26.15
50.00	-1.41	32.51	26.17
51.67	-1.41	32.52	26.18
53.33	-1.40	32.55	26.20
55.00	-1.40	32.56	26.21
56.67	-1.40	32.57	26.22
58.33	-1.40	32.58	26.23
60.00	-1.39	32.59	26.24
61.67	-1.39	32.60	26.24
63.33	-1.39	32.60	26.25
65.00	-1.40	32.63	26.27
66.67	-1.41	32.64	26.28
68.33	-1.41	32.66	26.29
70.00	-1.41	32.66	26.30
71.67	-1.40	32.67	26.31
73.33	-1.40	32.68	26.31
75.00	-1.40	32.69	26.32
76.67	-1.40	32.72	26.34
78.33	-1.42	32.72	26.34
80.00	-1.42	32.72	26.35
81.67	-1.42	32.74	26.36
83.33	-1.42	32.74	26.36
85.00	-1.41	32.75	26.37
86.67	-1.41	32.77	26.38
88.33	-1.39	32.78	26.39
90.00	-1.38	32.80	26.40
91.67	-1.37	32.81	26.41
93.33	-1.37	32.82	26.42
95.00	-1.36	32.82	26.43
96.67	-1.34	32.83	26.43
98.33	-1.32	32.84	26.44
100.00	-1.32	32.86	26.45
101.67	-1.31	32.86	26.45
103.33	-1.31	32.86	26.46
105.00	-1.31	32.87	26.46
106.67	-1.31	32.88	26.47
108.33	-1.31	32.89	26.48
110.00	-1.30	32.89	26.48
111.67	-1.30	32.90	26.49
113.33	-1.29	32.91	26.49
115.00	-1.30	32.92	26.50
116.67	-1.30	32.92	26.50
118.33	-1.31	32.93	26.51
120.00	-1.32	32.94	26.52
121.67	-1.30	33.01	26.58
123.33	-1.29	33.03	26.59
125.00	-1.29	33.04	26.60
126.67	-1.29	33.04	26.60
128.34	-1.29	33.04	26.60
130.00	-1.29	33.05	26.61
131.67	-1.28	33.06	26.61
133.34	-1.28	33.06	26.62
135.00	-1.28	33.07	26.62
136.67	-1.28	33.07	26.62
138.34	-1.28	33.06	26.62
140.00	-1.28	33.06	26.62
141.67	-1.28	33.07	26.62
143.34	-1.28	33.15	26.68

REFERENCE NO. 73-473- 27 STN- BA04 DATE 23/ 4/73
POSITION 74-23.0N, 94-19.0W GMT 16.2
RESULTS OF STD CAST 87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
9	-1.72	31.43	10	25.31	263.0	0.0	0.0	1436.
15	-1.74	31.89	15	25.68	232.5	0.13	0.02	1437.
20	-1.75	32.08	20	25.83	217.9	0.24	0.04	1437.
30	-1.57	32.23	30	25.95	206.7	0.45	0.09	1439.
50	-1.41	32.51	50	26.17	184.9	0.84	0.25	1440.
75	-1.40	32.69	74	26.32	170.7	1.29	0.53	1441.
100	-1.32	32.86	99	26.45	158.4	1.70	0.90	1442.
125	-1.29	33.04	124	26.60	144.4	2.08	1.33	1443.


SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
G
S
23 APR 73
GMT-1635
STN-BA05
31
32
33
34
SALINITY 0/00

REFERENCE NO, 73-473- 28 STN- BA05 DATE 23/ 4/73
POSITION 74-18,0N, 94-19,0W GMT 16,6
RESULTS OF STD CAST 98 POINTS TAKEN FROM ANALOG TRACE

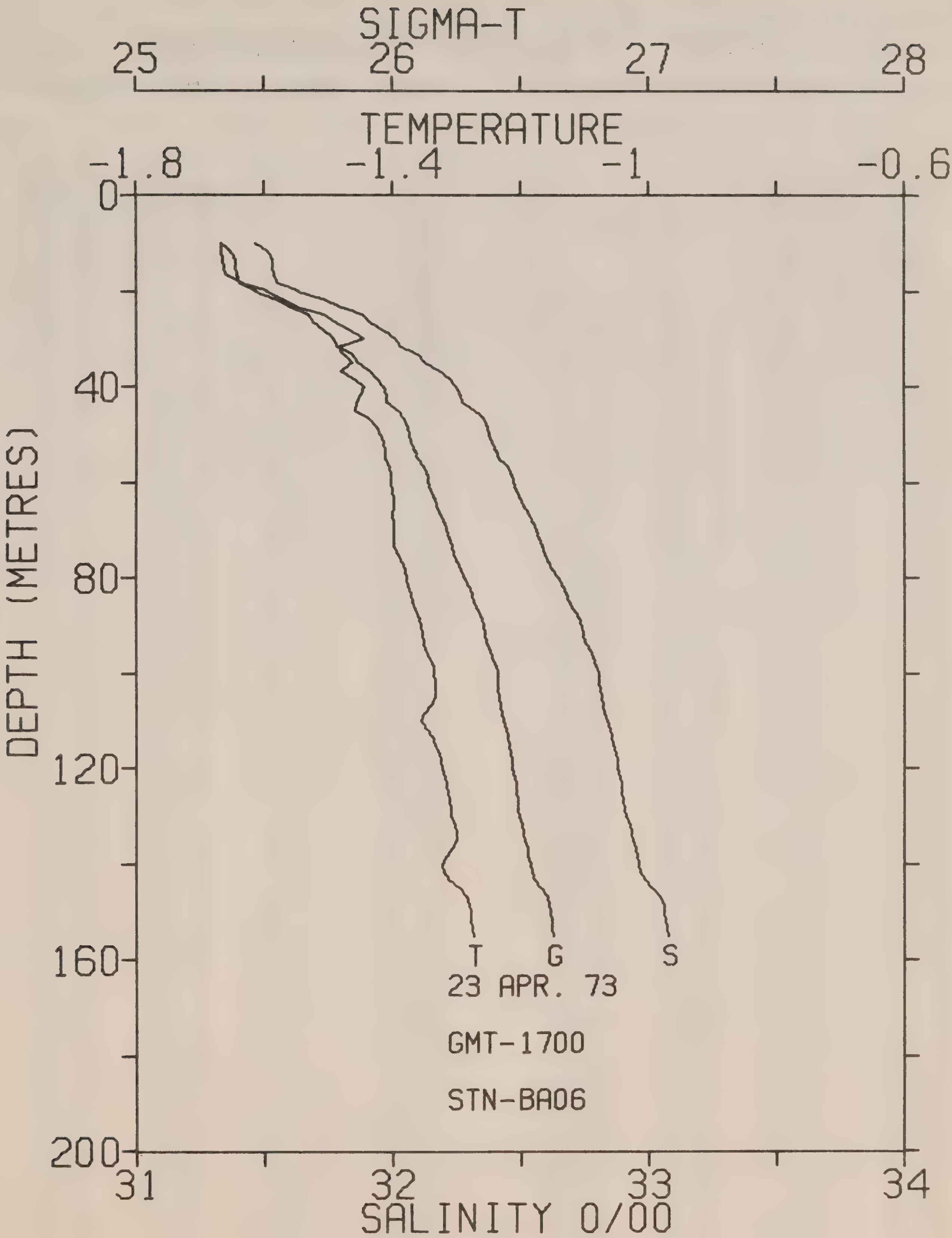
PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0,0	-1,77	off scale		78,33	-1,49	32,62	26,26
1,67	-1,72			80,00	-1,50	32,63	26,27
3,33	-1,71			81,67	-1,54	32,68	26,32
5,00	-1,71			83,33	-1,55	32,70	26,33
6,67	-1,68	31,54	25,39	85,00	-1,51	32,71	26,34
8,33	-1,64	31,66	25,49	86,67	-1,46	32,74	26,36
10,00	-1,64	31,83	25,62	88,33	-1,46	32,75	26,36
11,67	-1,65	31,95	25,72	90,00	-1,45	32,75	26,37
13,33	-1,65	32,00	25,76	91,67	-1,45	32,76	26,37
15,00	-1,65	32,03	25,79	93,33	-1,44	32,76	26,38
16,67	-1,66	32,06	25,82	95,00	-1,42	32,78	26,39
18,33	-1,65	32,10	25,84	96,67	-1,41	32,79	26,40
20,00	-1,65	32,13	25,87	98,33	-1,42	32,79	26,40
21,67	-1,65	32,17	25,90	100,00	-1,46	32,80	26,40
23,33	-1,65	32,17	25,90	101,67	-1,52	32,80	26,41
25,00	-1,64	32,19	25,92	103,33	-1,55	32,81	26,42
26,67	-1,64	32,20	25,93	105,00	-1,56	32,82	26,43
28,33	-1,64	32,22	25,94	106,67	-1,57	32,83	26,44
30,00	-1,64	32,23	25,95	108,33	-1,59	32,83	26,44
31,67	-1,65	32,26	25,97	110,00	-1,61	32,84	26,45
33,33	-1,65	32,26	25,98	111,67	-1,61	32,84	26,45
35,00	-1,65	32,26	25,97	113,33	-1,62	32,85	26,45
36,67	-1,65	32,26	25,98	115,00	-1,63	32,86	26,46
38,33	-1,65	32,27	25,98	116,67	-1,63	32,87	26,47
40,00	-1,64	32,28	25,99	118,33	-1,63	32,88	26,48
41,67	-1,64	32,30	26,01	120,00	-1,62	32,89	26,49
43,33	-1,64	32,31	26,02	121,67	-1,61	32,90	26,49
45,00	-1,64	32,33	26,03	123,33	-1,61	32,91	26,50
46,67	-1,64	32,32	26,03	125,00	-1,59	32,91	26,50
48,33	-1,64	32,33	26,03	126,67	-1,53	32,92	26,51
50,00	-1,64	32,33	26,03	128,34	-1,48	32,95	26,53
51,67	-1,63	32,33	26,03	130,00	-1,46	32,98	26,56
53,33	-1,63	32,34	26,04	131,67	-1,45	32,99	26,56
55,00	-1,62	32,36	26,06	133,34	-1,45	32,99	26,56
56,67	-1,61	32,40	26,09	135,00	-1,44	32,99	26,56
58,33	-1,60	32,41	26,10	136,67	-1,43	33,00	26,57
60,00	-1,59	32,43	26,12	138,34	-1,41	33,01	26,58
61,67	-1,58	32,45	26,13	140,00	-1,40	33,01	26,58
63,33	-1,57	32,47	26,14	141,67	-1,38	33,02	26,58
65,00	-1,55	32,49	26,16	143,34	-1,32	33,06	26,61
66,67	-1,54	32,51	26,18	145,00	-1,29	33,09	26,64
68,33	-1,54	32,52	26,18	146,67	-1,28	33,11	26,65
70,00	-1,51	32,55	26,20	148,34	-1,28	33,12	26,66
71,67	-1,51	32,57	26,22	150,00	-1,27	33,13	26,67
73,33	-1,51	32,58	26,23	151,67	-1,27	33,13	26,67
75,00	-1,50	32,58	26,23	153,34	-1,27	33,13	26,67
76,67	-1,49	32,61	26,25	155,00	-1,27	33,14	26,68

REFERENCE NO. 73-473- 28   STN- BA05   DATE 23/ 4/73
POSITION 74-18.0N, 94-19.0W GMT 16.6
RESULTS OF STD CAST   98 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
156.67	-1.27	33.13	26.67	160.00	-1.27	33.14	26.68
158.34	-1.27	33.14	26.68	161.67	-1.27	33.14	26.68

REFERENCE NO. 73-473- 28   STN- BA05   DATE 23/ 4/73
POSITION 74-18.0N, 94-19.0W GMT 16.6
RESULTS OF STD CAST   98 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
6	-1.68	31.53	7	25.38	257.0	0.0	0.0	1437.
10	-1.64	31.83	10	25.62	237.4	0.08	0.01	1437.
15	-1.65	32.03	15	25.79	221.4	0.20	0.02	1438.
20	-1.65	32.13	20	25.87	214.0	0.31	0.04	1438.
30	-1.64	32.23	30	25.95	206.0	0.52	0.09	1438.
50	-1.64	32.33	50	26.03	198.5	0.92	0.26	1439.
75	-1.50	32.58	74	26.23	178.9	1.39	0.56	1440.
100	-1.46	32.80	99	26.40	162.6	1.81	0.93	1441.
125	-1.59	32.91	124	26.50	153.1	2.21	1.38	1441.
150	-1.27	33.13	149	26.67	137.3	2.57	1.89	1443.



SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
T
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23 APR. 73
GMT-1700
STN-BA06
31
32
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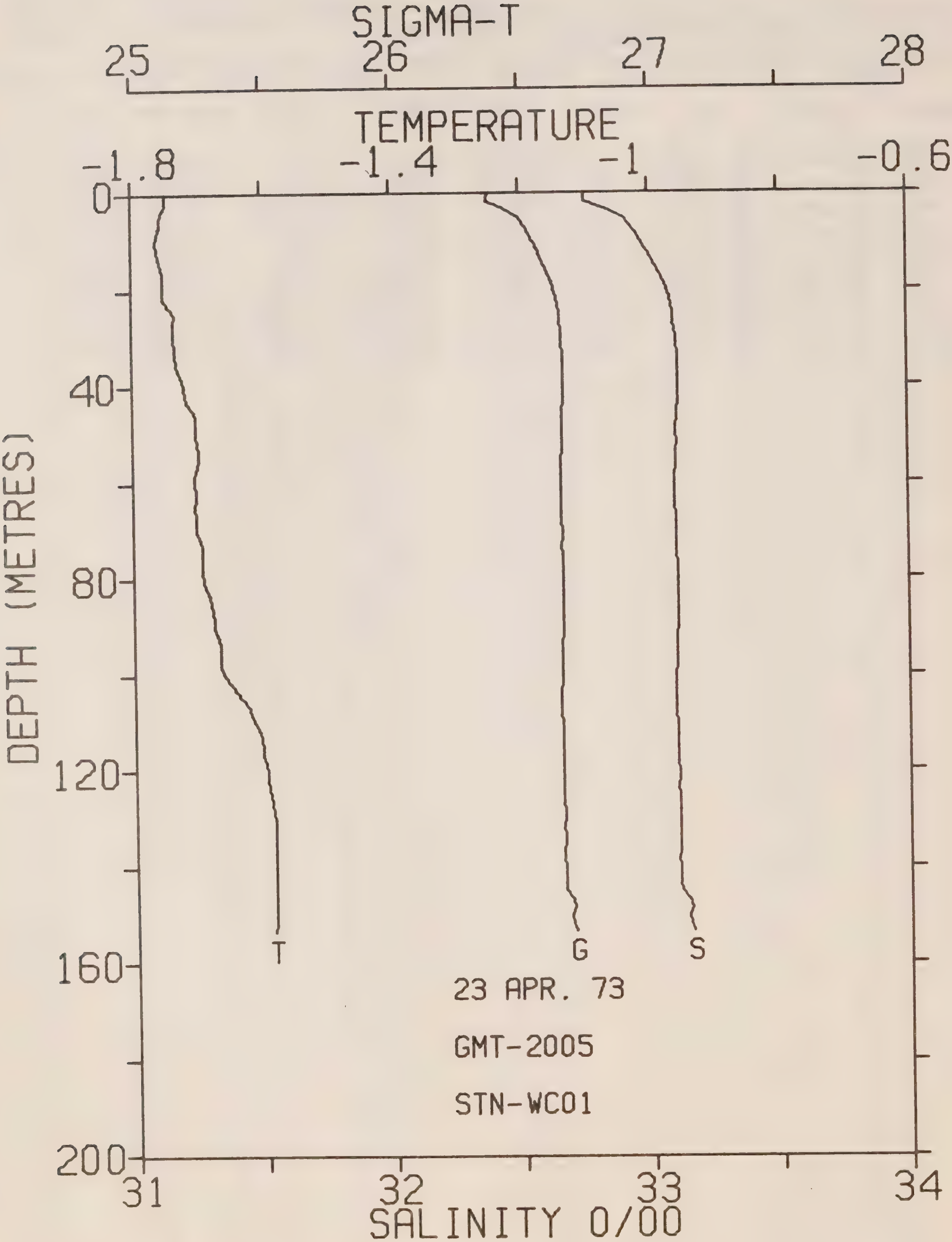
34
SALINITY 0/00

REFERENCE NO. 73-473- 29 STN- BA06 DATE 23/ 4/73
POSITION 74-13.0N, 94-19.0W GMT 17.0
RESULTS OF STD CAST 94 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T
0.0	-1.74		
1.67	-1.67		
3.33	-1.67	off scale	
5.00	-1.67		
6.67	-1.66		
8.33	-1.64		
10.00	-1.67	31.47	25.34
11.67	-1.67	31.51	25.37
13.33	-1.66	31.53	25.39
15.00	-1.66	31.53	25.39
16.67	-1.66	31.54	25.39
18.33	-1.63	31.56	25.40
20.00	-1.60	31.63	25.47
21.67	-1.57	31.73	25.54
23.33	-1.55	31.81	25.61
25.00	-1.51	31.89	25.67
26.67	-1.49	31.92	25.69
28.33	-1.46	31.97	25.74
30.00	-1.44	32.01	25.77
31.67	-1.49	32.04	25.79
33.33	-1.48	32.10	25.84
35.00	-1.46	32.13	25.87
36.67	-1.48	32.18	25.91
38.33	-1.46	32.22	25.94
40.00	-1.44	32.25	25.96
41.67	-1.45	32.27	25.98
43.33	-1.45	32.27	25.98
45.00	-1.46	32.32	26.02
46.67	-1.44	32.35	26.05
48.33	-1.42	32.37	26.06
50.00	-1.42	32.38	26.07
51.67	-1.41	32.39	26.07
53.33	-1.41	32.40	26.09
55.00	-1.41	32.42	26.10
56.67	-1.41	32.45	26.12
58.33	-1.40	32.47	26.14
60.00	-1.40	32.47	26.14
61.67	-1.40	32.48	26.15
63.33	-1.40	32.50	26.17
65.00	-1.40	32.51	26.17
66.67	-1.40	32.53	26.19
68.33	-1.40	32.55	26.20
70.00	-1.40	32.56	26.21
71.67	-1.40	32.57	26.22
73.33	-1.40	32.58	26.23
75.00	-1.39	32.59	26.24
76.67	-1.38	32.61	26.25
78.33	-1.38	32.62	26.26
80.00	-1.38	32.65	26.28
81.67	-1.38	32.67	26.30
83.33	-1.37	32.68	26.31
85.00	-1.37	32.69	26.32
86.67	-1.36	32.71	26.33
88.33	-1.36	32.73	26.35
90.00	-1.35	32.74	26.35
91.67	-1.35	32.74	26.36
93.33	-1.35	32.75	26.37
95.00	-1.35	32.77	26.38
96.67	-1.34	32.78	26.39
98.33	-1.34	32.80	26.40
100.00	-1.33	32.81	26.41
101.67	-1.33	32.81	26.41
103.33	-1.33	32.81	26.41
105.00	-1.33	32.82	26.42
106.67	-1.34	32.82	26.42
108.33	-1.35	32.83	26.43
110.00	-1.35	32.84	26.44
111.67	-1.35	32.85	26.45
113.33	-1.34	32.86	26.45
115.00	-1.33	32.86	26.46
116.67	-1.33	32.87	26.46
118.33	-1.32	32.88	26.47
120.00	-1.32	32.88	26.47
121.67	-1.32	32.89	26.48
123.33	-1.31	32.89	26.48
125.00	-1.31	32.90	26.48
126.67	-1.31	32.90	26.49
128.34	-1.31	32.90	26.49
130.00	-1.31	32.91	26.49
131.67	-1.30	32.93	26.51
133.34	-1.30	32.93	26.51
135.00	-1.30	32.94	26.52
136.67	-1.31	32.95	26.53
138.34	-1.32	32.95	26.53
140.00	-1.32	32.96	26.54
141.67	-1.32	32.97	26.54
143.34	-1.31	32.99	26.56
145.00	-1.30	33.01	26.58
146.67	-1.28	33.05	26.60
148.34	-1.28	33.06	26.61
150.00	-1.28	33.06	26.62
151.67	-1.28	33.07	26.62
153.34	-1.28	33.07	26.62
155.00	-1.27	33.08	26.63

REFERENCE NO. 73-473- 29   STN- BA06   DATE 23/ 4/73
POSITION 74-13.0N, 94-19.0W   GMT 17.0
RESULTS OF STD CAST   94 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
9	-1.67	31.46	10	25.33	260.5	0.0	0.0	1437.
15	-1.66	31.53	15	25.39	259.8	0.13	0.02	1437.
20	-1.60	31.63	20	25.47	252.4	0.26	0.04	1437.
30	-1.44	32.01	30	25.77	223.3	0.50	0.10	1439.
50	-1.42	32.38	50	26.07	195.2	0.91	0.27	1440.
75	-1.39	32.59	74	26.24	178.4	1.37	0.56	1441.
100	-1.33	32.81	99	26.41	162.2	1.80	0.94	1442.
125	-1.31	32.90	124	26.48	155.0	2.20	1.39	1442.
150	-1.28	33.06	149	26.62	142.2	2.57	1.92	1443.



SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
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DEPTH (METRES)
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23 APR. 73
GMT-2005
STN-WC01
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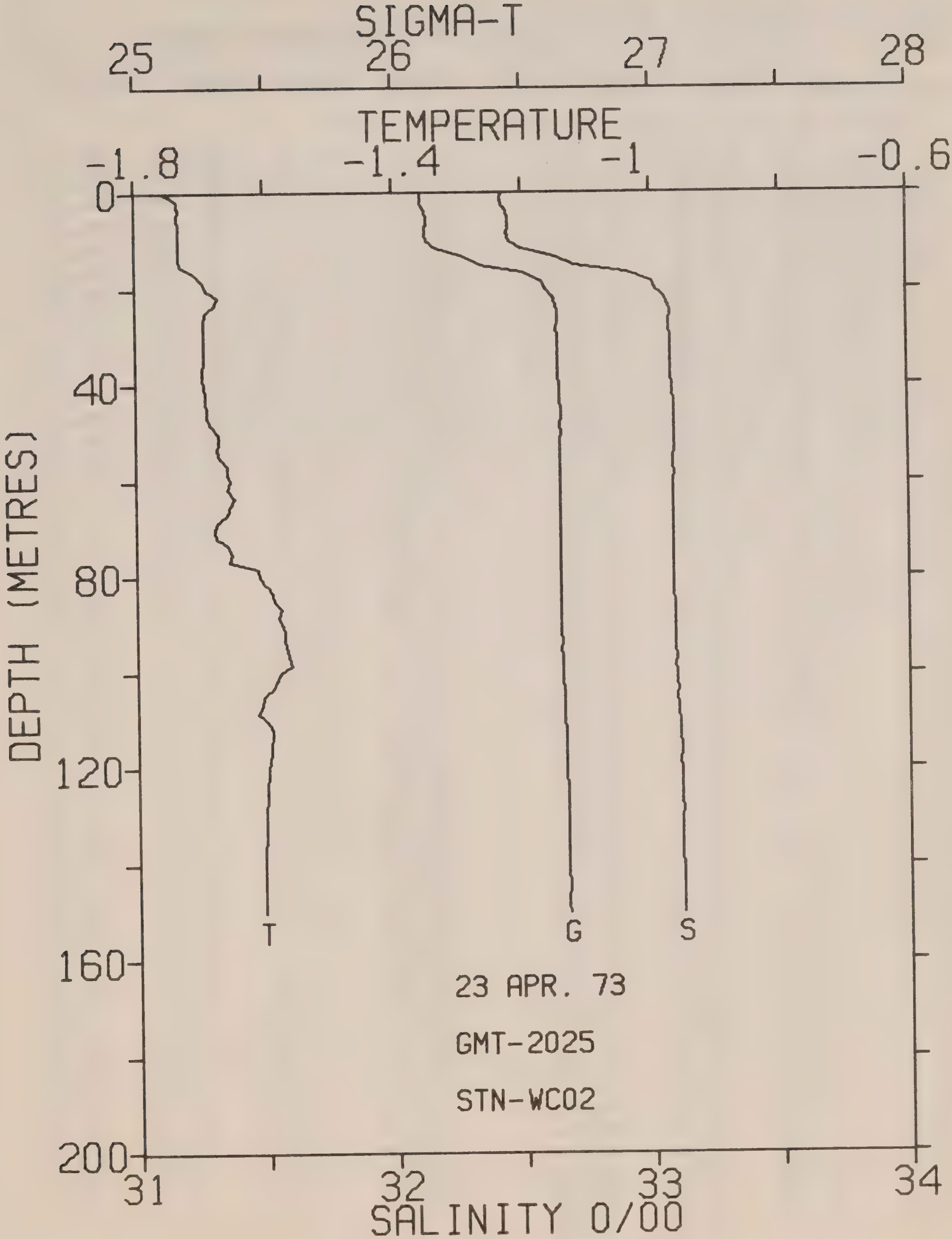
34
SALINITY 0/00

REFERENCE NO. 73-473- 30   STN- WC01   DATE 23/ 4/73
POSITION 74-47.0N, 93-11.0W   GMT 20.1
RESULTS OF STD CAST   93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.75	32.76	26.38	78.33	-1.69	33.10	26.66
1.67	-1.75	32.76	26.38	80.00	-1.69	33.11	26.66
3.33	-1.75	32.83	26.44	81.67	-1.69	33.11	26.66
5.00	-1.75	32.90	26.50	83.33	-1.68	33.11	26.66
6.67	-1.76	32.93	26.52	85.00	-1.68	33.11	26.66
8.33	-1.76	32.96	26.54	86.67	-1.68	33.10	26.66
10.00	-1.76	32.97	26.56	88.33	-1.68	33.10	26.66
11.67	-1.76	32.99	26.57	90.00	-1.68	33.10	26.66
13.33	-1.76	33.01	26.59	91.67	-1.67	33.10	26.66
15.00	-1.75	33.03	26.60	93.33	-1.67	33.10	26.66
16.67	-1.75	33.04	26.61	95.00	-1.67	33.10	26.66
18.33	-1.75	33.06	26.63	96.67	-1.67	33.10	26.66
20.00	-1.75	33.07	26.64	98.33	-1.67	33.10	26.66
21.67	-1.75	33.08	26.65	100.00	-1.66	33.10	26.65
23.33	-1.74	33.09	26.65	101.67	-1.65	33.10	26.65
25.00	-1.73	33.09	26.65	103.33	-1.64	33.09	26.65
26.67	-1.73	33.10	26.66	105.00	-1.63	33.09	26.65
28.33	-1.73	33.10	26.66	106.67	-1.62	33.10	26.65
30.00	-1.73	33.10	26.66	108.33	-1.62	33.10	26.65
31.67	-1.73	33.11	26.66	110.00	-1.61	33.10	26.65
33.33	-1.73	33.11	26.67	111.67	-1.61	33.10	26.65
35.00	-1.73	33.11	26.67	113.33	-1.60	33.10	26.65
36.67	-1.73	33.11	26.67	115.00	-1.60	33.10	26.66
38.33	-1.72	33.11	26.67	116.67	-1.60	33.10	26.66
40.00	-1.72	33.11	26.67	118.33	-1.60	33.10	26.66
41.67	-1.72	33.11	26.67	120.00	-1.60	33.10	26.66
43.33	-1.72	33.11	26.66	121.67	-1.60	33.10	26.66
45.00	-1.71	33.10	26.66	123.33	-1.59	33.10	26.66
46.67	-1.70	33.10	26.66	125.00	-1.59	33.10	26.66
48.33	-1.70	33.10	26.66	126.67	-1.59	33.10	26.66
50.00	-1.70	33.10	26.66	128.34	-1.59	33.11	26.66
51.67	-1.70	33.10	26.66	130.00	-1.59	33.10	26.66
53.33	-1.70	33.10	26.66	131.67	-1.59	33.10	26.66
55.00	-1.70	33.10	26.66	133.34	-1.59	33.11	26.66
56.67	-1.70	33.10	26.66	135.00	-1.59	33.10	26.66
58.33	-1.70	33.10	26.65	136.67	-1.59	33.10	26.66
60.00	-1.70	33.10	26.65	138.34	-1.58	33.10	26.66
61.67	-1.70	33.09	26.65	140.00	-1.58	33.10	26.66
63.33	-1.70	33.10	26.65	141.67	-1.58	33.11	26.66
65.00	-1.70	33.10	26.65	143.34	-1.58	33.11	26.66
66.67	-1.70	33.10	26.66	145.00	-1.58	33.11	26.66
68.33	-1.70	33.10	26.66	146.67	-1.59	33.14	26.69
70.00	-1.70	33.10	26.66	148.34	-1.59	33.15	26.70
71.67	-1.70	33.10	26.66	150.00	-1.59	33.14	26.68
73.33	-1.69	33.10	26.66	151.67	-1.59	33.14	26.69
75.00	-1.69	33.10	26.66	153.34	-1.59	33.15	26.70
76.67	-1.69	33.10	26.66				

REFFRENCE NO. 73-473- 30 STN- WC01 DATE 23/ 4/73
POSITION 74-47.0N, 93-11.0W GMT 20.1
RESULTS OF STD CAST 93 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.75	32.76	0	26.38	165.4	0.0	0.0	1438.
1	-1.75	32.76	1	26.38	165.7	0.02	0.00	1438.
3	-1.75	32.82	3	26.43	160.9	0.05	0.00	1438.
5	-1.75	32.90	5	26.50	154.4	0.08	0.00	1438.
7	-1.76	32.94	7	26.53	151.8	0.11	0.00	1438.
10	-1.76	32.97	10	26.56	148.9	0.16	0.01	1438.
15	-1.75	33.03	15	26.60	144.8	0.23	0.02	1439.
20	-1.75	33.07	20	26.64	141.3	0.30	0.03	1439.
30	-1.73	33.10	30	26.66	138.8	0.44	0.07	1439.
50	-1.70	33.10	50	26.66	138.9	0.72	0.18	1440.
75	-1.69	33.10	74	26.66	138.7	1.07	0.40	1440.
100	-1.66	33.10	99	26.65	139.0	1.41	0.71	1441.
125	-1.59	33.10	124	26.66	138.4	1.76	1.10	1441.
150	-1.59	33.14	149	26.68	135.8	2.10	1.59	1442.


SIGMA-T
25
26
27
28
TEMPERATURE
-1.8
-1.4
-1
-0.6
DEPTH (METRES)
0
40
80
120
160
200
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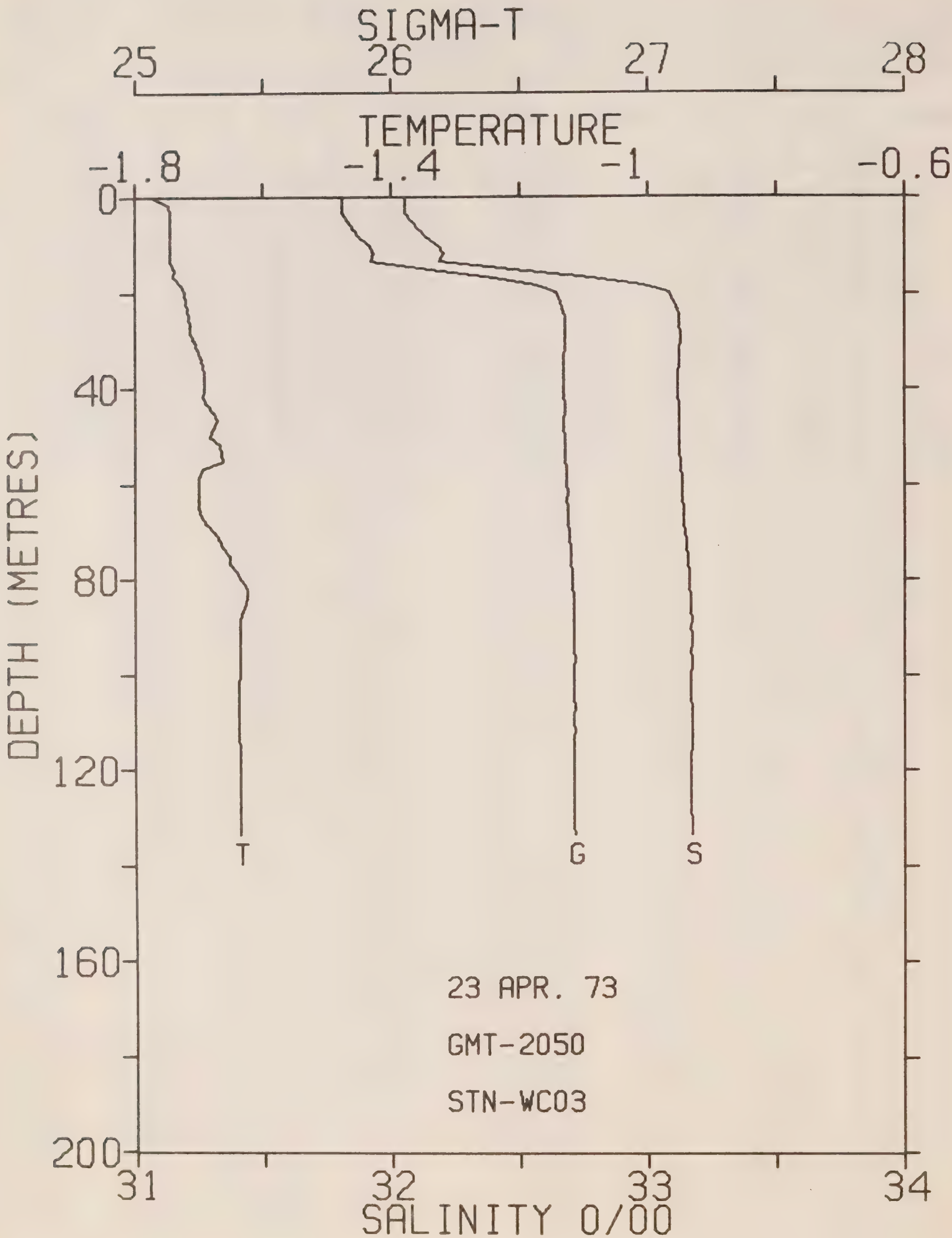
23 APR. 73
GMT-2025
STN-WC02
31
32
33
34
SALINITY 0/00

REFERENCE NO. 73-473- 31 STN- WC02 DATE 23/ 4/73
POSITION 74-47.0N, 92-58.0W GMT 20.4
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.76	32.43	26.11	76.67	-1.65	33.08	26.64
1.67	-1.73	32.42	26.11	78.33	-1.61	33.08	26.64
3.33	-1.73	32.44	26.12	80.00	-1.61	33.08	26.64
5.00	-1.73	32.45	26.13	81.67	-1.60	33.09	26.64
6.67	-1.73	32.45	26.13	83.33	-1.59	33.08	26.64
8.33	-1.73	32.44	26.13	85.00	-1.59	33.09	26.64
10.00	-1.73	32.45	26.14	86.67	-1.57	33.09	26.65
11.67	-1.73	32.50	26.17	88.33	-1.58	33.09	26.64
13.33	-1.73	32.64	26.28	90.00	-1.57	33.09	26.65
15.00	-1.73	32.71	26.34	91.67	-1.57	33.09	26.65
16.67	-1.71	32.91	26.50	93.33	-1.57	33.09	26.65
18.33	-1.70	33.00	26.58	95.00	-1.57	33.09	26.65
20.00	-1.69	33.02	26.59	96.67	-1.56	33.09	26.65
21.67	-1.67	33.05	26.62	98.33	-1.56	33.09	26.65
23.33	-1.68	33.07	26.63	100.00	-1.58	33.10	26.65
25.00	-1.69	33.08	26.64	101.67	-1.59	33.10	26.65
26.67	-1.69	33.07	26.64	103.33	-1.59	33.10	26.65
28.33	-1.69	33.07	26.64	105.00	-1.60	33.10	26.65
30.00	-1.69	33.08	26.64	106.67	-1.61	33.10	26.66
31.67	-1.69	33.08	26.64	108.33	-1.61	33.10	26.66
33.33	-1.69	33.08	26.64	110.00	-1.60	33.10	26.66
35.00	-1.69	33.08	26.64	111.67	-1.59	33.11	26.66
36.67	-1.70	33.08	26.64	113.33	-1.59	33.11	26.66
38.33	-1.70	33.08	26.64	115.00	-1.59	33.11	26.66
40.00	-1.69	33.08	26.64	116.67	-1.59	33.11	26.66
41.67	-1.69	33.08	26.64	118.33	-1.60	33.11	26.66
43.33	-1.69	33.09	26.65	120.00	-1.60	33.11	26.66
45.00	-1.69	33.09	26.65	121.67	-1.60	33.11	26.66
46.67	-1.69	33.09	26.65	123.33	-1.60	33.11	26.66
48.33	-1.68	33.09	26.65	125.00	-1.60	33.11	26.67
50.00	-1.67	33.09	26.65	126.67	-1.60	33.11	26.67
51.67	-1.67	33.09	26.65	128.34	-1.60	33.11	26.67
53.33	-1.67	33.09	26.65	130.00	-1.60	33.11	26.67
55.00	-1.67	33.09	26.65	131.67	-1.60	33.11	26.67
56.67	-1.66	33.08	26.64	133.34	-1.60	33.11	26.66
58.33	-1.66	33.09	26.65	135.00	-1.60	33.11	26.66
60.00	-1.65	33.09	26.65	136.67	-1.60	33.11	26.67
61.67	-1.66	33.08	26.64	138.34	-1.60	33.11	26.67
63.33	-1.65	33.08	26.64	140.00	-1.61	33.11	26.67
65.00	-1.65	33.08	26.64	141.67	-1.61	33.12	26.67
66.67	-1.66	33.09	26.64	143.34	-1.61	33.12	26.67
68.33	-1.67	33.08	26.64	145.00	-1.61	33.12	26.67
70.00	-1.68	33.08	26.64	146.67	-1.61	33.12	26.67
71.67	-1.68	33.08	26.64	148.34	-1.61	33.12	26.67
73.33	-1.66	33.08	26.64	150.00	-1.61	33.12	26.67
75.00	-1.65	33.08	26.64				

REFFRENCE NO. 73-473- 31 STN- WC02 DATE 23/ 4/73
POSITION 74-47.0N, 92-58.0W GMT 20.4
RESULTS OF STD CAST 91 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.76	32.43	0	26.11	191.0	0.0	0.0	1438.
1	-1.74	32.42	1	26.11	191.3	0.02	0.00	1438.
3	-1.73	32.43	3	26.12	190.5	0.06	0.00	1438.
5	-1.73	32.45	5	26.13	189.2	0.10	0.00	1438.
7	-1.73	32.45	7	26.13	189.4	0.13	0.00	1438.
10	-1.73	32.45	10	26.14	188.9	0.19	0.01	1438.
15	-1.73	32.71	15	26.34	169.1	0.28	0.02	1438.
20	-1.69	33.02	20	26.59	145.3	0.36	0.03	1439.
30	-1.69	33.08	30	26.64	141.1	0.50	0.07	1439.
50	-1.67	33.09	50	26.65	139.9	0.78	0.18	1440.
75	-1.65	33.08	74	26.64	140.2	1.13	0.41	1440.
100	-1.58	33.10	99	26.65	139.2	1.48	0.72	1441.
125	-1.60	33.11	124	26.67	137.7	1.83	1.12	1441.



SIGMA-T
25
26
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TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
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23 APR. 73
GMT-2050
STN-WC03
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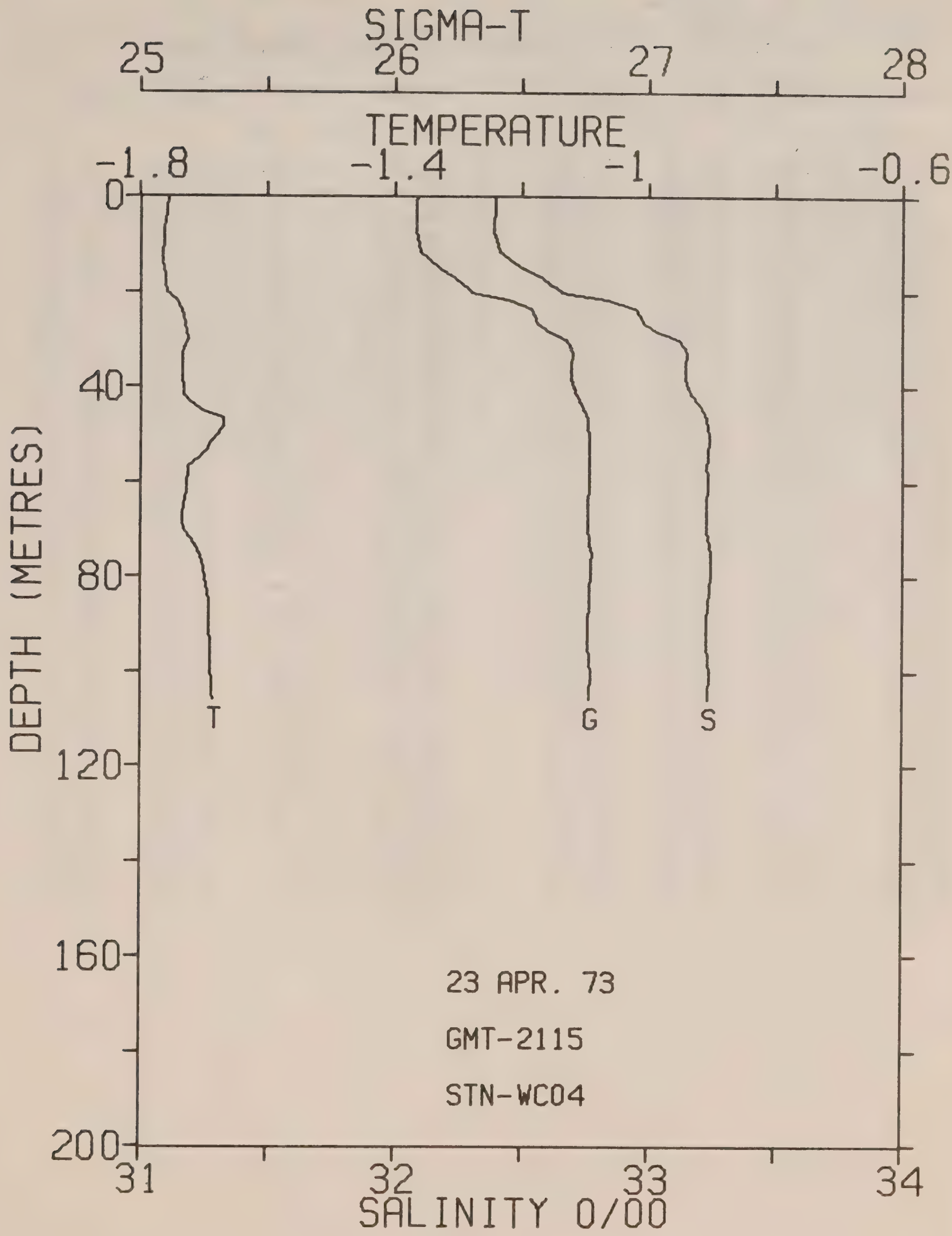
SALINITY 0/00

REFERENCE NO. 73-473- 32 STN- WC03 DATE 23/ 4/73
POSITION 74-47.0N, 92-43.0W GMT 20.8
RESULTS OF STD CAST 81 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.77	32.06	25.81	68.33	-1.69	33.14	26.69
1.67	-1.75	32.06	25.81	70.00	-1.67	33.14	26.69
3.33	-1.74	32.05	25.81	71.67	-1.67	33.15	26.70
5.00	-1.74	32.08	25.84	73.33	-1.66	33.15	26.70
6.67	-1.74	32.11	25.86	75.00	-1.65	33.15	26.70
8.33	-1.74	32.14	25.88	76.67	-1.65	33.15	26.70
10.00	-1.74	32.18	25.92	78.33	-1.64	33.16	26.70
11.67	-1.74	32.21	25.93	80.00	-1.63	33.16	26.71
13.33	-1.74	32.19	25.92	81.67	-1.63	33.16	26.71
15.00	-1.74	32.48	26.15	83.33	-1.63	33.17	26.71
16.67	-1.74	32.74	26.37	85.00	-1.63	33.17	26.71
18.33	-1.73	32.98	26.56	86.67	-1.63	33.17	26.71
20.00	-1.72	33.08	26.65	88.33	-1.63	33.17	26.71
21.67	-1.72	33.10	26.66	90.00	-1.64	33.17	26.71
23.33	-1.72	33.11	26.67	91.67	-1.63	33.17	26.71
25.00	-1.72	33.12	26.68	93.33	-1.63	33.17	26.71
26.67	-1.71	33.12	26.68	95.00	-1.63	33.17	26.71
28.33	-1.71	33.13	26.68	96.67	-1.64	33.17	26.71
30.00	-1.71	33.13	26.68	98.33	-1.64	33.17	26.71
31.67	-1.70	33.12	26.68	100.00	-1.64	33.17	26.71
33.33	-1.70	33.12	26.67	101.67	-1.64	33.17	26.71
35.00	-1.69	33.12	26.67	103.33	-1.64	33.17	26.71
36.67	-1.69	33.12	26.67	105.00	-1.64	33.17	26.71
38.33	-1.69	33.12	26.67	106.67	-1.64	33.17	26.71
40.00	-1.69	33.12	26.67	108.33	-1.64	33.17	26.71
41.67	-1.69	33.12	26.67	110.00	-1.64	33.17	26.71
43.33	-1.69	33.12	26.68	111.67	-1.64	33.17	26.71
45.00	-1.67	33.12	26.68	113.33	-1.64	33.17	26.71
46.67	-1.67	33.12	26.67	115.00	-1.64	33.17	26.71
48.33	-1.68	33.12	26.67	116.67	-1.64	33.17	26.71
50.00	-1.68	33.12	26.68	118.33	-1.64	33.17	26.71
51.67	-1.67	33.12	26.68	120.00	-1.63	33.17	26.71
53.33	-1.66	33.12	26.68	121.67	-1.63	33.17	26.71
55.00	-1.66	33.13	26.68	123.33	-1.63	33.17	26.71
56.67	-1.69	33.13	26.68	125.00	-1.63	33.17	26.71
58.33	-1.70	33.13	26.68	126.67	-1.63	33.17	26.71
60.00	-1.70	33.13	26.68	128.34	-1.63	33.17	26.71
61.67	-1.70	33.14	26.69	130.00	-1.63	33.17	26.71
63.33	-1.70	33.13	26.69	131.67	-1.63	33.17	26.71
65.00	-1.70	33.14	26.69	133.34	-1.64	33.17	26.71
66.67	-1.70	33.14	26.69				

REFERENCE NO. 73-473- 32 STN- WC03 DATE 23/ 4/73
POSITION 74-47.0N, 92-43.0W GMT 20.8
RESULTS OF STD CAST 81 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.77	32.06	0	25.81	219.4	0.0	0.0	1437.
1	-1.76	32.06	1	25.81	219.7	0.02	0.00	1437.
3	-1.74	32.05	3	25.81	219.8	0.07	0.00	1437.
5	-1.74	32.08	5	25.84	217.4	0.11	0.00	1437.
7	-1.74	32.12	7	25.86	214.9	0.15	0.01	1437.
10	-1.74	32.18	10	25.92	209.9	0.22	0.01	1437.
15	-1.74	32.48	15	26.15	187.2	0.32	0.02	1438.
20	-1.72	33.08	20	26.65	140.4	0.40	0.04	1439.
30	-1.71	33.13	30	26.68	137.2	0.54	0.07	1439.
50	-1.68	33.12	50	26.68	137.3	0.81	0.19	1440.
75	-1.65	33.15	74	26.70	134.9	1.15	0.40	1440.
100	-1.64	33.17	99	26.71	133.5	1.49	0.70	1441.
125	-1.63	33.17	124	26.71	133.4	1.82	1.08	1441.


SIGMA-T
25
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TEMPERATURE
-1.8
-1.4
-1
-0.6
0
40
80
120
160
200
DEPTH (METRES)
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23 APR. 73
GMT-2115
STN-WC04
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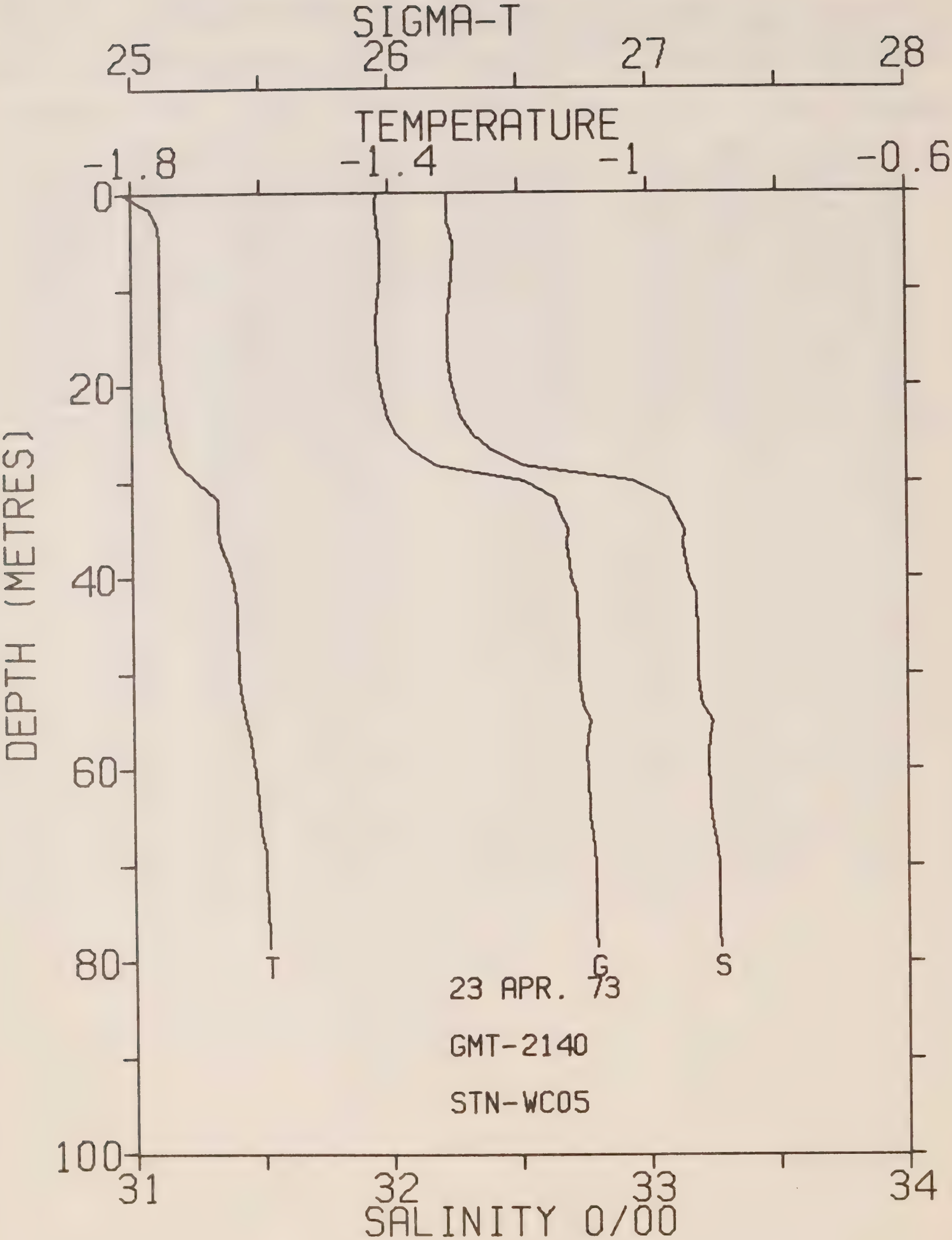
34
SALINITY 0/00

REFERENCE NO. 73-473- 33 STN- WC04 DATE 23/ 4/73
POSITION 74-47.0N, 92-31.0W GMT 21.3
RESULTS OF STD CAST 65 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.76	32.39	26.09	53.33	-1.70	33.24	26.77
1.67	-1.76	32.39	26.09	55.00	-1.71	33.23	26.76
3.33	-1.76	32.39	26.08	56.67	-1.72	33.23	26.76
5.00	-1.76	32.39	26.08	58.33	-1.73	33.23	26.77
6.67	-1.76	32.39	26.08	60.00	-1.73	33.23	26.76
8.33	-1.76	32.40	26.09	61.67	-1.73	33.23	26.76
10.00	-1.76	32.40	26.09	63.33	-1.73	33.23	26.76
11.67	-1.76	32.41	26.10	65.00	-1.73	33.23	26.76
13.33	-1.76	32.46	26.14	66.67	-1.73	33.23	26.76
15.00	-1.76	32.50	26.18	68.33	-1.73	33.23	26.76
16.67	-1.76	32.56	26.22	70.00	-1.73	33.23	26.76
18.33	-1.76	32.61	26.26	71.67	-1.72	33.23	26.77
20.00	-1.76	32.66	26.30	73.33	-1.71	33.24	26.77
21.67	-1.74	32.84	26.44	75.00	-1.71	33.24	26.78
23.33	-1.73	32.94	26.53	76.67	-1.70	33.24	26.77
25.00	-1.73	32.96	26.55	78.33	-1.70	33.24	26.77
26.67	-1.73	32.98	26.56	80.00	-1.70	33.24	26.77
28.33	-1.73	33.04	26.61	81.67	-1.70	33.24	26.77
30.00	-1.72	33.12	26.67	83.33	-1.69	33.24	26.77
31.67	-1.73	33.15	26.70	85.00	-1.69	33.24	26.77
33.33	-1.73	33.15	26.70	86.67	-1.69	33.23	26.76
35.00	-1.73	33.15	26.69	88.33	-1.69	33.23	26.76
36.67	-1.73	33.14	26.69	90.00	-1.69	33.23	26.76
38.33	-1.73	33.14	26.69	91.67	-1.69	33.23	26.76
40.00	-1.73	33.15	26.70	93.33	-1.69	33.23	26.76
41.67	-1.73	33.17	26.71	95.00	-1.69	33.23	26.76
43.33	-1.72	33.19	26.73	96.67	-1.69	33.23	26.76
45.00	-1.70	33.22	26.75	98.33	-1.69	33.23	26.77
46.67	-1.67	33.23	26.76	100.00	-1.69	33.24	26.77
48.33	-1.67	33.23	26.76	101.67	-1.69	33.24	26.77
50.00	-1.68	33.24	26.77	103.33	-1.69	33.23	26.77
51.67	-1.69	33.24	26.77	105.00	-1.69	33.23	26.77

REFERENCE NO. 73-473- 33   STN- WC04   DATE 23/ 4/73
POSITION 74-47.0N, 92-31.0W   GMT 21.3
RESULTS OF STD CAST   65 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.76	32.39	0	26.09	193.4	0.0	0.0	1437.
1	-1.76	32.39	1	26.09	193.7	0.02	0.00	1437.
3	-1.76	32.39	3	26.08	193.8	0.06	0.00	1437.
5	-1.76	32.39	5	26.08	193.9	0.10	0.00	1438.
7	-1.76	32.39	7	26.08	193.8	0.14	0.00	1438.
10	-1.76	32.40	10	26.09	192.8	0.19	0.01	1438.
15	-1.76	32.50	15	26.18	184.9	0.29	0.02	1438.
20	-1.76	32.66	20	26.30	173.2	0.38	0.04	1438.
30	-1.72	33.12	30	26.67	137.8	0.53	0.08	1439.
50	-1.68	33.24	50	26.77	128.5	0.80	0.18	1440.
75	-1.71	33.24	74	26.78	127.7	1.12	0.39	1440.
100	-1.69	33.24	99	26.77	128.0	1.44	0.67	1441.



SIGMA-T
25
26
27
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TEMPERATURE
-1.8
-1.4
-1
-0.6
0
20
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60
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100
DEPTH (METRES)
T
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23 APR. 73
GMT-2140
STN-WC05
31
32
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34
SALINITY 0/00

REFERENCE NO. 73-473- 34 STN- WC05 DATE 23/ 4/73
POSITION 74-47.0N, 92-19.0W GMT 21.7
RESULTS OF STD CAST 48 POINTS TAKEN FROM ANALOG TRACE

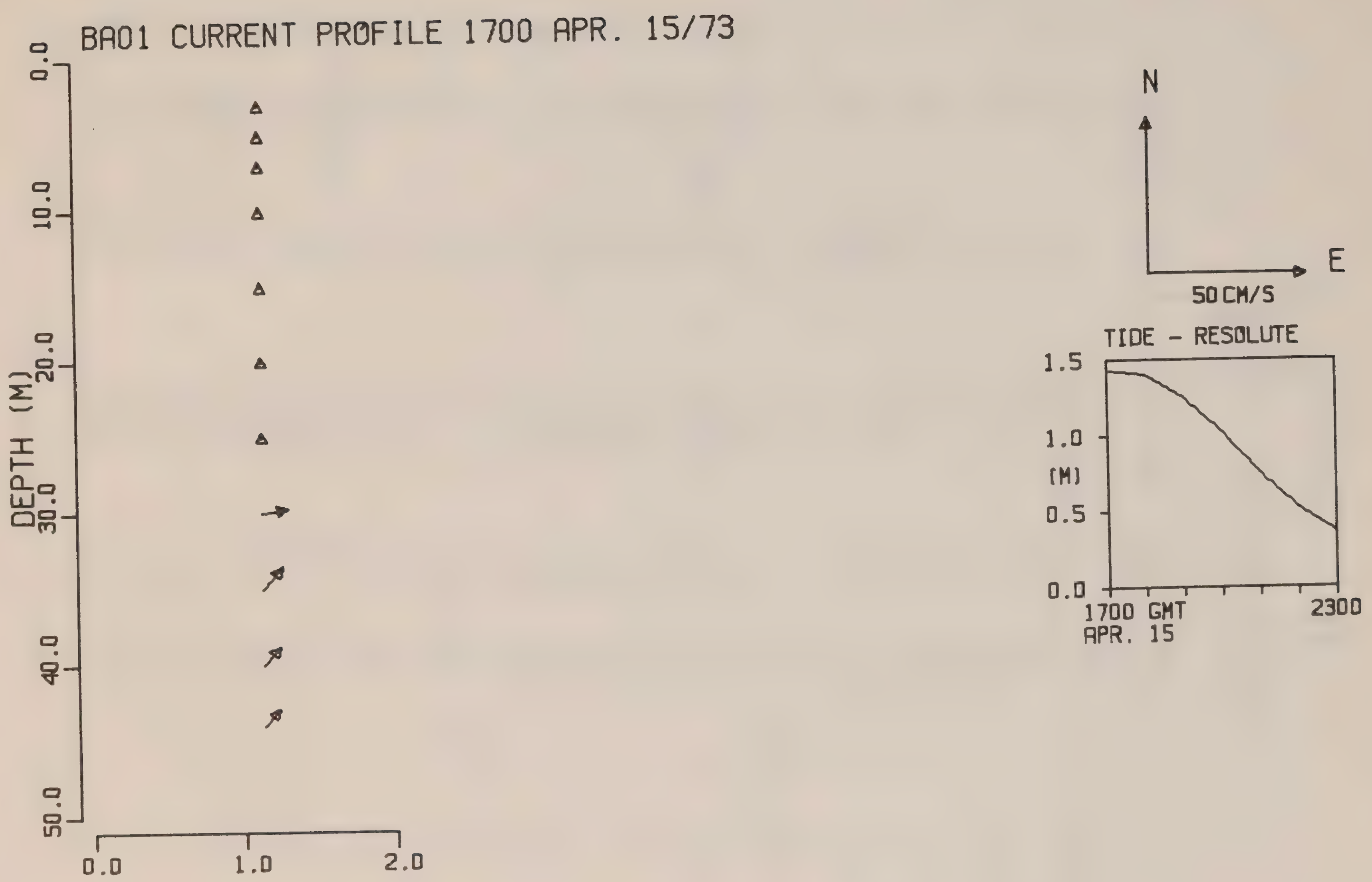
PRESS	TEMP	SAL	SIGMA T	PRESS	TEMP	SAL	SIGMA T
0.0	-1.81	32.23	25.95	40.00	-1.64	33.15	26.70
1.67	-1.77	32.23	25.95	41.67	-1.64	33.18	26.72
3.33	-1.76	32.23	25.95	43.33	-1.64	33.18	26.72
5.00	-1.76	32.25	25.97	45.00	-1.64	33.19	26.73
6.67	-1.76	32.25	25.97	46.67	-1.64	33.19	26.73
8.33	-1.76	32.24	25.96	48.33	-1.63	33.19	26.73
10.00	-1.75	32.24	25.96	50.00	-1.63	33.19	26.73
11.67	-1.75	32.24	25.96	51.67	-1.63	33.19	26.73
13.33	-1.75	32.23	25.95	53.33	-1.63	33.21	26.74
15.00	-1.75	32.23	25.95	55.00	-1.62	33.25	26.77
16.67	-1.76	32.23	25.95	56.67	-1.62	33.23	26.76
18.33	-1.75	32.23	25.95	58.33	-1.62	33.23	26.76
20.00	-1.75	32.24	25.96	60.00	-1.61	33.23	26.76
21.67	-1.75	32.26	25.98	61.67	-1.61	33.23	26.76
23.33	-1.75	32.28	25.99	63.33	-1.61	33.24	26.77
25.00	-1.74	32.32	26.03	65.00	-1.61	33.24	26.77
26.67	-1.74	32.39	26.09	66.67	-1.60	33.25	26.78
28.33	-1.73	32.52	26.19	68.33	-1.60	33.26	26.79
30.00	-1.70	32.94	26.52	70.00	-1.60	33.27	26.79
31.67	-1.67	33.08	26.64	71.67	-1.60	33.27	26.79
33.33	-1.67	33.11	26.66	73.33	-1.59	33.27	26.79
35.00	-1.67	33.14	26.69	75.00	-1.59	33.27	26.79
36.67	-1.66	33.13	26.68	76.67	-1.59	33.27	26.79
38.33	-1.65	33.15	26.69	78.33	-1.59	33.27	26.79

REFERENCE NO. 73-473- 34 STN- WC05 DATE 23/ 4/73
POSITION 74-47.0N, 92-19.0W GMT 21.7
RESULTS OF STD CAST 48 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT EN	SOUND VEL
0	-1.81	32.23	0	25.95	206.1	0.0	0.0	1437.
1	-1.79	32.23	1	25.95	206.3	0.02	0.00	1437.
3	-1.76	32.23	3	25.95	206.2	0.06	0.00	1437.
5	-1.76	32.25	5	25.97	204.7	0.10	0.00	1437.
7	-1.76	32.25	7	25.97	204.9	0.14	0.01	1437.
10	-1.75	32.24	10	25.96	205.4	0.21	0.01	1437.
15	-1.75	32.23	15	25.95	206.4	0.31	0.02	1437.
20	-1.75	32.24	20	25.96	205.0	0.41	0.04	1438.
30	-1.70	32.94	30	26.52	151.7	0.60	0.09	1439.
50	-1.63	33.19	50	26.73	132.5	0.88	0.20	1440.
75	-1.59	33.27	74	26.79	126.4	1.20	0.40	1441.

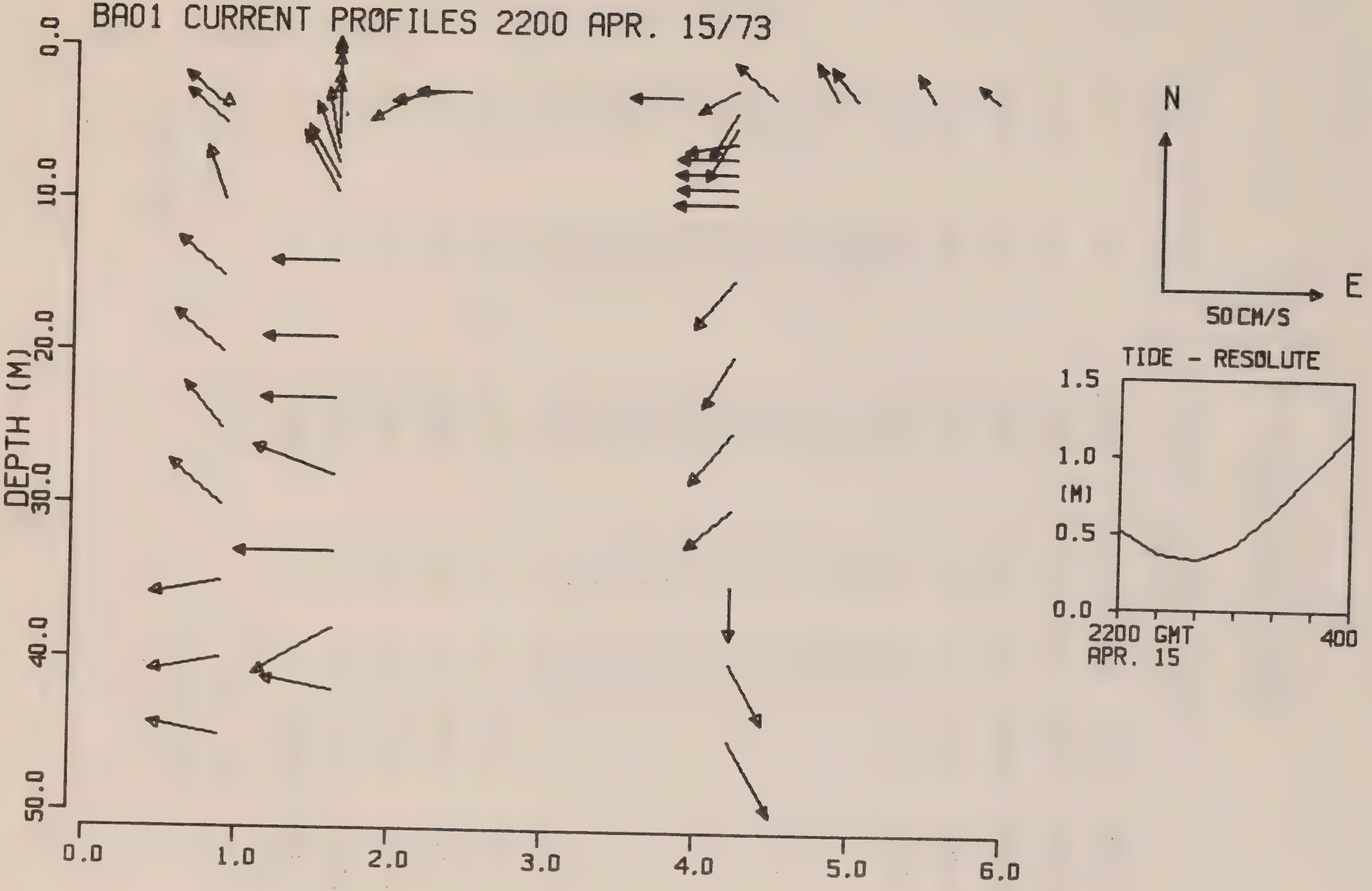
Appendix 2

Current Profiles


BA01 CURRENT PRØFILE 1700 APR. 15/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
1700 GMT
APR. 15
2300

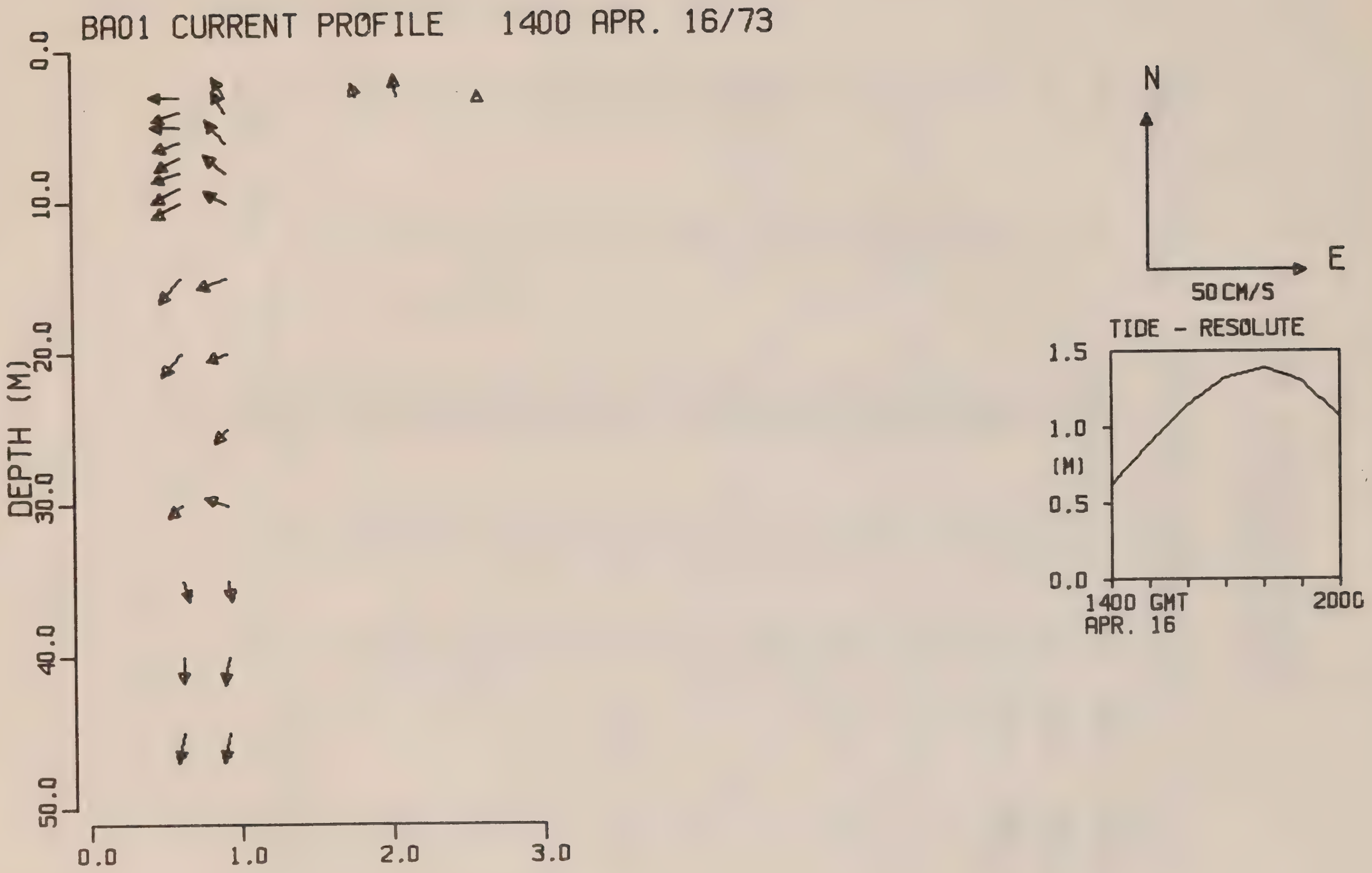
STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

	DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR, 15,1973 18: 8	3.0	0.	0.	0.	0.
	5.0	0.	0.	0.	0.
	7.0	0.	0.	0.	0.
	10.0	0.	0.	0.	0.
	15.0	0.	0.	0.	0.
	20.0	0.	0.	0.	0.
	25.0	0.	0.	0.	0.
	30.0	7.	80.	1.	7.
	35.0	8.	40.	6.	5.
	40.0	6.	40.	5.	4.
	44.0	6.	40.	4.	4.
APR, 15,1973 22:53	3.5	0.	0.	0.	0.
	4.0	16.	310.	10.	-12.
	5.0	15.	310.	10.	-12.
	10.0	16.	340.	15.	-6.
	15.0	18.	310.	12.	-14.
	20.0	20.	310.	13.	-15.
	25.0	18.	320.	14.	-12.
	30.0	21.	310.	13.	-16.
	35.0	22.	260.	-4.	-21.
	40.0	22.	260.	-4.	-21.
	45.0	22.	280.	4.	-21.
APR, 15,1973 23:37	2.3	13.	0.	13.	0.
	2.8	14.	0.	14.	0.
	3.8	15.	0.	15.	0.
	4.7	14.	0.	14.	0.
	5.6	15.	0.	15.	0.
	6.6	18.	350.	18.	-3.
	7.5	19.	340.	18.	-7.
	8.5	18.	330.	16.	-9.
	9.4	21.	330.	18.	-10.
	14.0	20.	270.	-0.	-20.
	19.0	22.	270.	-0.	-22.
	23.0	23.	270.	-0.	-23.
	28.0	26.	290.	9.	-25.
	33.0	30.	270.	-0.	-30.
	38.0	28.	240.	-14.	-24.
	42.0	22.	280.	4.	-21.


BA01 CURRENT PROFILES 2200 APR. 15/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
2200 GMT
APR. 15
400

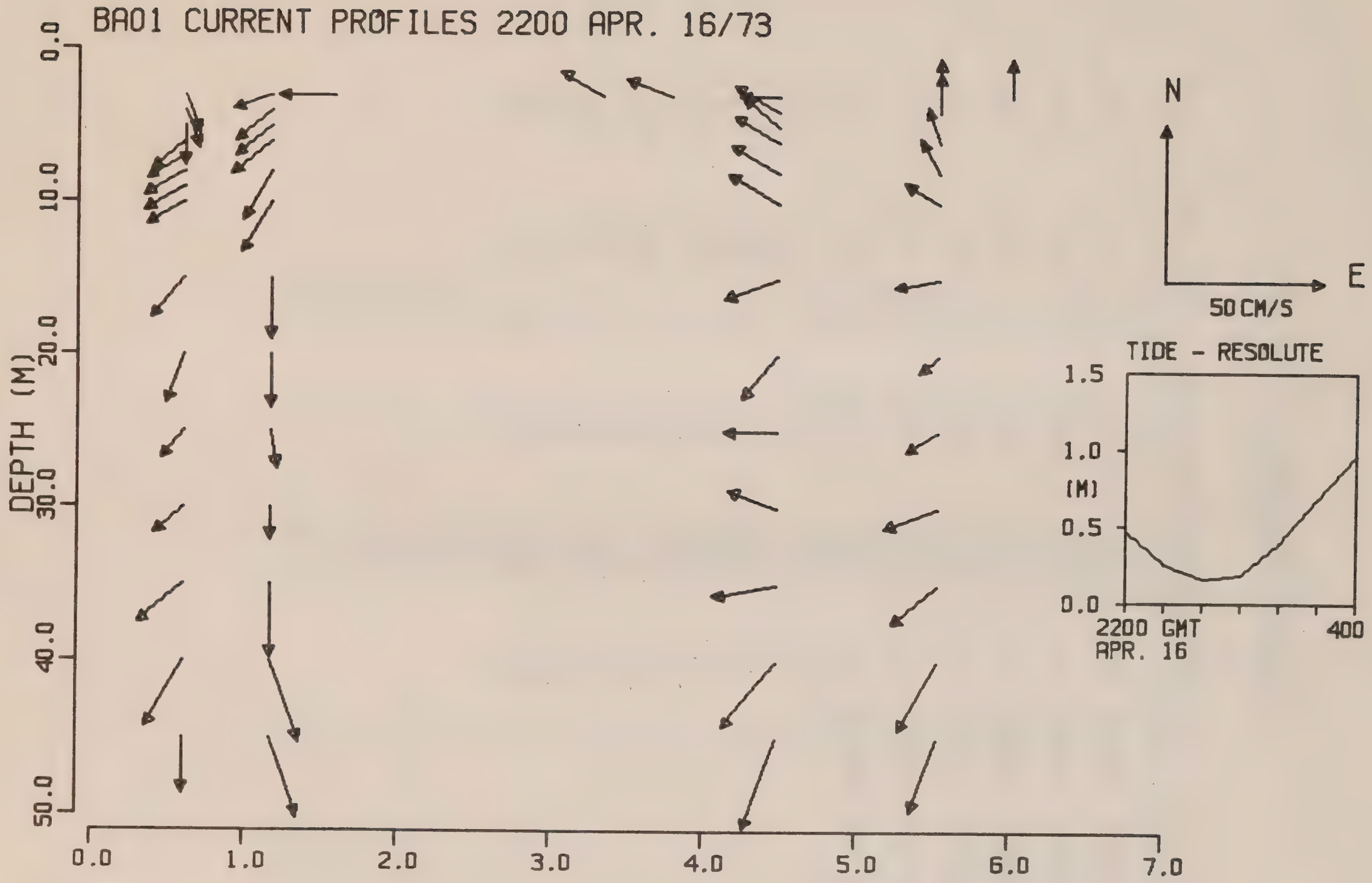
STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 16,1973	0:10	2.8	18.	240.	-9.	-16.
APR. 16,1973	0:20	2.8	17.	260.	-3.	-17.
APR. 16,1973	0:28	2.8	15.	270.	-0.	-15.
APR. 16,1973	1:51	3.0	15.	270.	-0.	-15.
APR. 16,1973	2:13	2.5	13.	240.	-6.	-11.
		4.0	15.	210.	-13.	-8.
		5.0	18.	210.	-16.	-9.
		6.0	15.	260.	-3.	-15.
		7.0	18.	270.	-0.	-18.
		8.0	18.	270.	-0.	-18.
		9.0	18.	270.	-0.	-18.
		10.0	19.	270.	-0.	-19.
		15.0	19.	220.	-14.	-12.
		20.0	18.	210.	-15.	-9.
		25.0	20.	220.	-15.	-13.
		30.0	18.	230.	-11.	-13.
		35.0	15.	180.	-15.	0.
		40.0	21.	150.	-18.	10.
		45.0	26.	150.	-23.	13.
APR. 16,1973	2:28	3.0	16.	310.	10.	-12.
APR. 16,1973	2:52	3.0	12.	330.	10.	-6.
APR. 16,1973	3: 0	3.0	12.	320.	9.	-8.
APR. 16,1973	3:30	3.0	9.	330.	8.	-4.
APR. 16,1973	3:55	3.0	7.	310.	4.	-5.


BA01 CURRENT PROFILE 1400 APR. 16/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
1400 GMT
APR. 16
2000

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 16,1973	4:25	3.0	7.	310.	4.	-5.
APR. 16,1973	4:47	3.0	9.	320.	7.	-6.
APR. 16,1973	14:37	3.0	8.	270.	-0.	-8.
		4.0	8.	250.	-3.	-7.
		5.0	8.	270.	-0.	-8.
		6.0	7.	250.	-2.	-7.
		7.0	7.	240.	-4.	-6.
		8.0	8.	250.	-3.	-7.
		9.0	8.	240.	-4.	-7.
		10.0	8.	240.	-4.	-7.
		15.0	9.	220.	-7.	-6.
		20.0	8.	220.	-6.	-5.
		30.0	4.	230.	-3.	-3.
		35.0	5.	160.	-5.	2.
		40.0	7.	180.	-7.	0.
		45.0	8.	190.	-8.	-1.
APR. 16,1973	14:55	3.0	6.	330.	5.	-3.
		4.0	6.	330.	5.	-3.
		6.0	8.	320.	6.	-5.
		8.0	7.	310.	5.	-6.
		10.0	6.	300.	3.	-5.
		15.0	8.	250.	-3.	-8.
		20.0	5.	250.	-2.	-5.
		25.0	4.	220.	-3.	-3.
		30.0	6.	290.	2.	-6.
		35.0	5.	170.	-5.	1.
		40.0	7.	190.	-7.	-1.
		45.0	8.	190.	-8.	-1.
APR. 16,1973	15:47	3.0	3.	340.	2.	-1.
APR. 16,1973	16: 3	3.0	5.	350.	5.	-1.



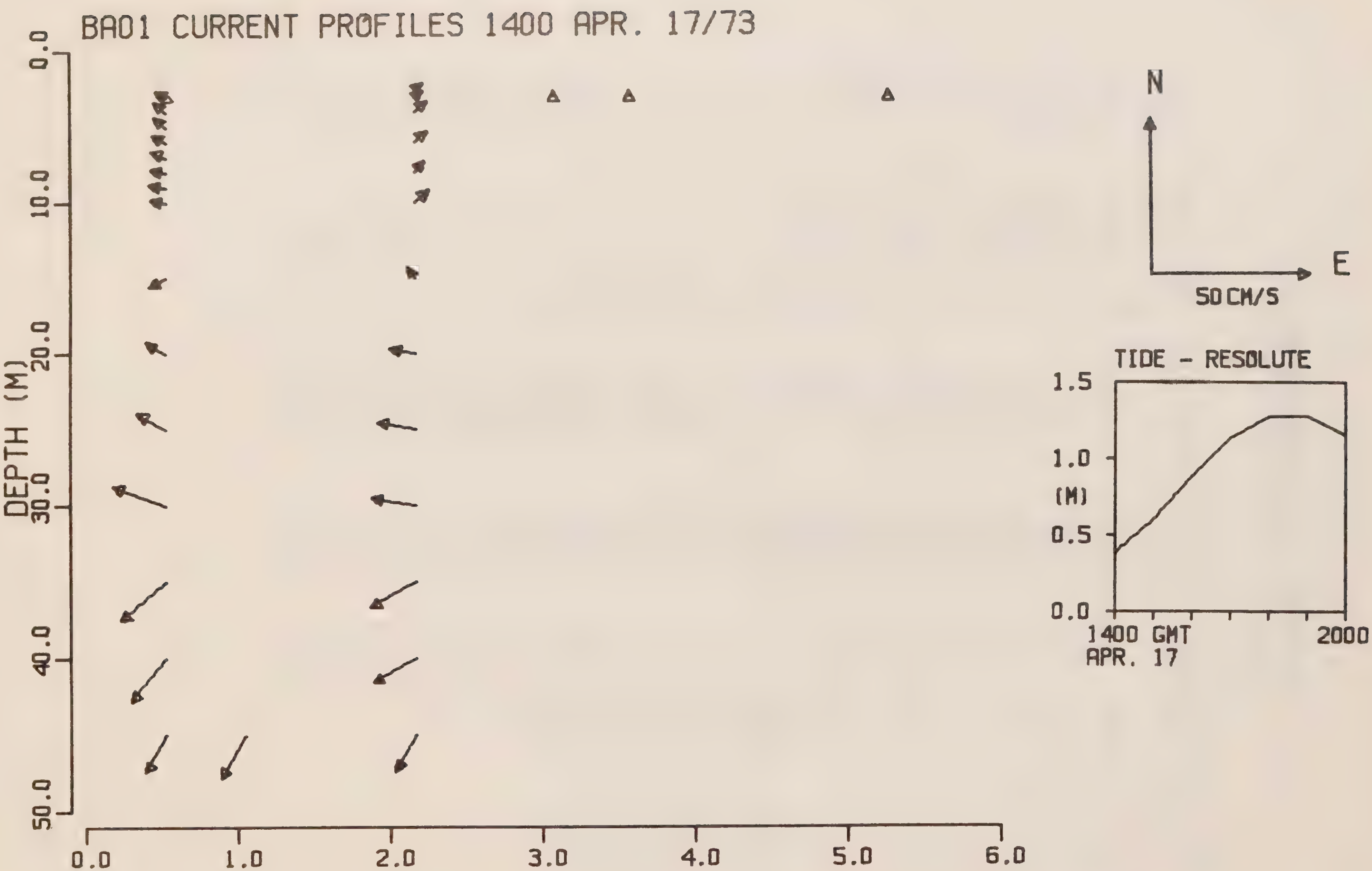
BA01 CURRENT PROFILES 2200 APR. 16/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
2200 GMT
APR. 16
400

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 16,1973	16:35	3.0	0.	0.	0.	0.
APR. 16,1973	20:32	3.0	7.	240.	-3.	-6.
APR. 16,1973	20:45	3.0	8.	240.	-4.	-7.
APR. 16,1973	21: 0	3.0	8.	250.	-3.	-8.
APR. 16,1973	22:15	3.0	13.	260.	-2.	-13.
APR. 16,1973	22:36	3.0	11.	160.	-11.	4.
		4.0	11.	160.	-11.	4.
		5.0	11.	180.	-11.	0.
		6.0	13.	230.	-8.	-10.
		7.0	13.	240.	-6.	-11.
		8.0	14.	240.	-7.	-12.
		9.0	14.	240.	-7.	-12.
		10.0	13.	240.	-6.	-11.
		15.0	15.	220.	-12.	-10.
		20.0	15.	200.	-15.	-5.
		25.0	10.	220.	-8.	-7.
		30.0	11.	230.	-7.	-9.
		35.0	18.	230.	-12.	-14.
		40.0	23.	210.	-20.	-12.
		45.0	16.	180.	-16.	0.

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

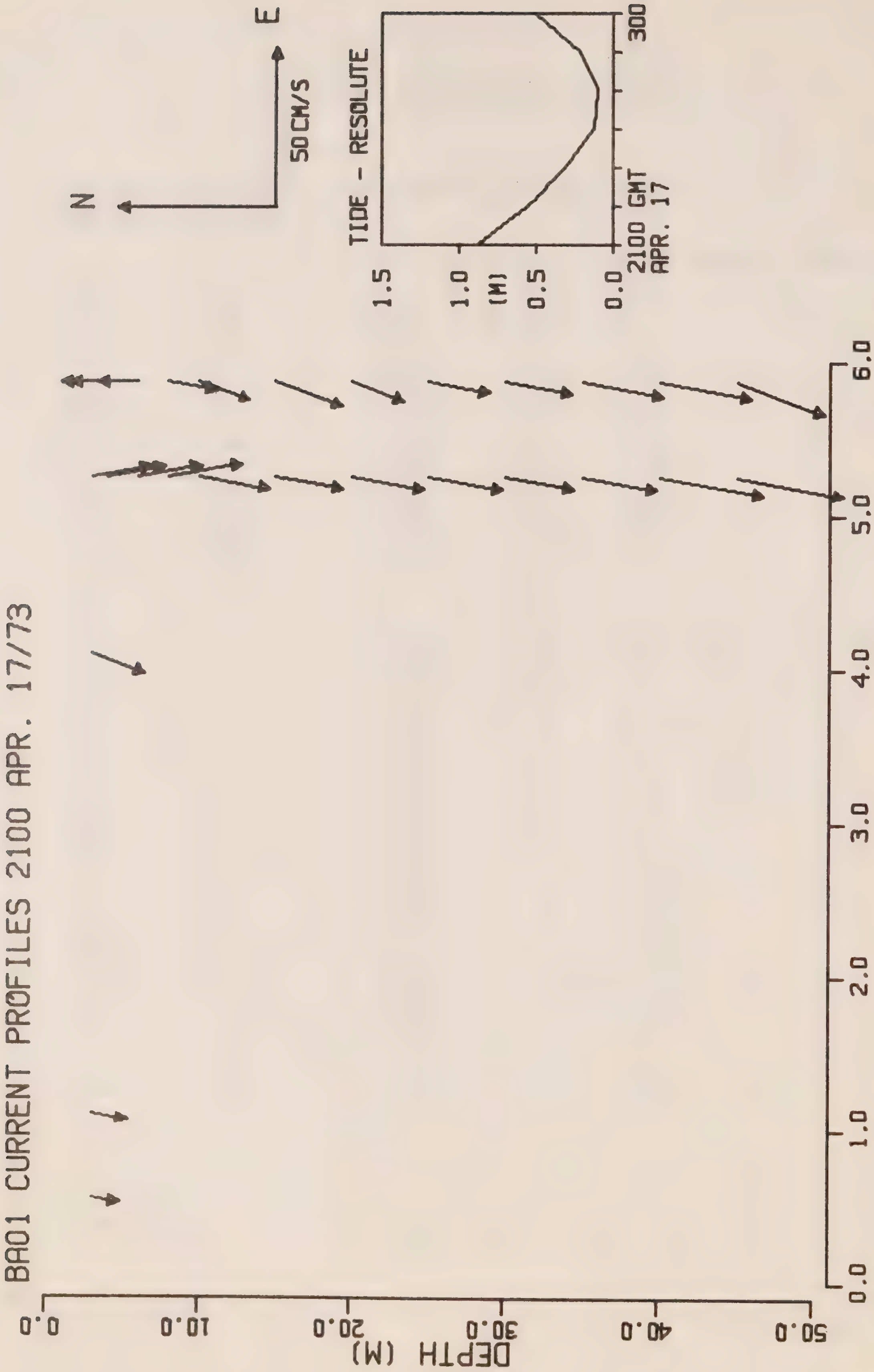
	DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 16,1973 23:10	3.0	12.	250.	-4.	-11.
	4.0	14.	230.	-9.	-11.
	5.0	14.	230.	-9.	-11.
	6.0	15.	230.	-10.	-12.
	8.0	16.	210.	-14.	-8.
	10.0	18.	210.	-15.	-9.
	15.0	18.	180.	-18.	0.
	20.0	16.	180.	-16.	0.
	25.0	11.	170.	-11.	2.
	30.0	9.	180.	-9.	0.
	35.0	22.	180.	-22.	0.
	40.0	26.	160.	-25.	9.
	45.0	26.	160.	-24.	9.
APR. 16,1973 23:35	3.0	17.	270.	-0.	-17.
APR. 17,1973 1:20	3.0	14.	300.	7.	-12.
APR. 17,1973 1:47	3.0	14.	290.	5.	-14.
APR. 17,1973 2:29	3.0	11.	270.	-0.	-11.
	4.0	15.	300.	8.	-13.
	5.0	14.	310.	9.	-11.
	6.0	15.	300.	8.	-13.
	8.0	16.	300.	8.	-14.
	10.0	18.	300.	9.	-15.
	15.0	17.	250.	-6.	-16.
	20.0	16.	220.	-13.	-11.
	25.0	16.	270.	-0.	-16.
	30.0	15.	290.	5.	-15.
	35.0	20.	260.	-3.	-19.
	40.0	26.	220.	-20.	-17.
	45.0	29.	200.	-28.	-10.



BA01 CURRENT PROFILES 1400 APR. 17/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
1400 GMT
APR. 17
2000

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 17,1973	3:32	3.0	11.	0.	11.	0.
		4.0	11.	0.	11.	0.
		6.0	11.	340.	10.	-4.
		8.0	11.	330.	10.	-6.
		10.0	12.	300.	6.	-10.
		15.0	13.	260.	-2.	-13.
		20.0	7.	230.	-4.	-5.
		25.0	11.	240.	-5.	-9.
		30.0	17.	250.	-6.	-16.
		35.0	18.	230.	-12.	-14.
		40.0	24.	210.	-21.	-12.
		45.0	23.	200.	-22.	-8.
APR. 17,1973	4: 0	3.0	11.	0.	11.	0.
APR. 17,1973	14:32	3.0	3.	300.	1.	-2.
		3.0	0.	340.	0.	0.
		4.0	4.	310.	2.	-3.
		5.0	4.	310.	2.	-3.
		6.0	4.	300.	2.	-3.
		7.0	4.	290.	1.	-3.
		8.0	4.	280.	1.	-4.
		9.0	4.	280.	1.	-4.
		10.0	4.	280.	1.	-4.
		15.0	5.	240.	-2.	-4.
		20.0	6.	300.	3.	-5.
		25.0	9.	300.	5.	-8.
		30.0	17.	290.	6.	-16.
		35.0	18.	230.	-12.	-14.
		40.0	16.	220.	-13.	-11.
		45.0	12.	210.	-11.	-6.
APR. 17,1973	15: 3	45.0	14.	210.	-12.	-7.


BA01 CURRENT PROFILES 2100 APR. 17/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
2100 GMT
APR. 17
300

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 17,1973	16:10	2.5	2.	50.	1.	1.
		3.0	2.	50.	1.	1.
		4.0	4.	50.	2.	3.
		6.0	4.	50.	2.	3.
		8.0	3.	40.	2.	2.
		10.0	4.	50.	3.	3.
		15.0	3.	330.	2.	-1.
		20.0	7.	280.	1.	-7.
		25.0	11.	280.	2.	-11.
		30.0	13.	280.	2.	-13.
		35.0	15.	240.	-8.	-13.
		40.0	14.	240.	-7.	-12.
		45.0	12.	210.	-10.	-6.
APR. 17,1973	17: 5	3.0	0.	0.	0.	0.
APR. 17,1973	17:35	3.0	0.	0.	0.	0.
APR. 17,1973	19:17	3.0	0.	0.	0.	0.
APR. 17,1973	21:33	3.0	8.	190.	-8.	-1.
APR. 17,1973	22: 6	3.0	10.	190.	-10.	-2.
APR. 18,1973	1: 6	3.0	17.	200.	-16.	-6.


BA01 CURRENT PROFILES 0300 APR. 18/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
300
APR. 18
GMT
900

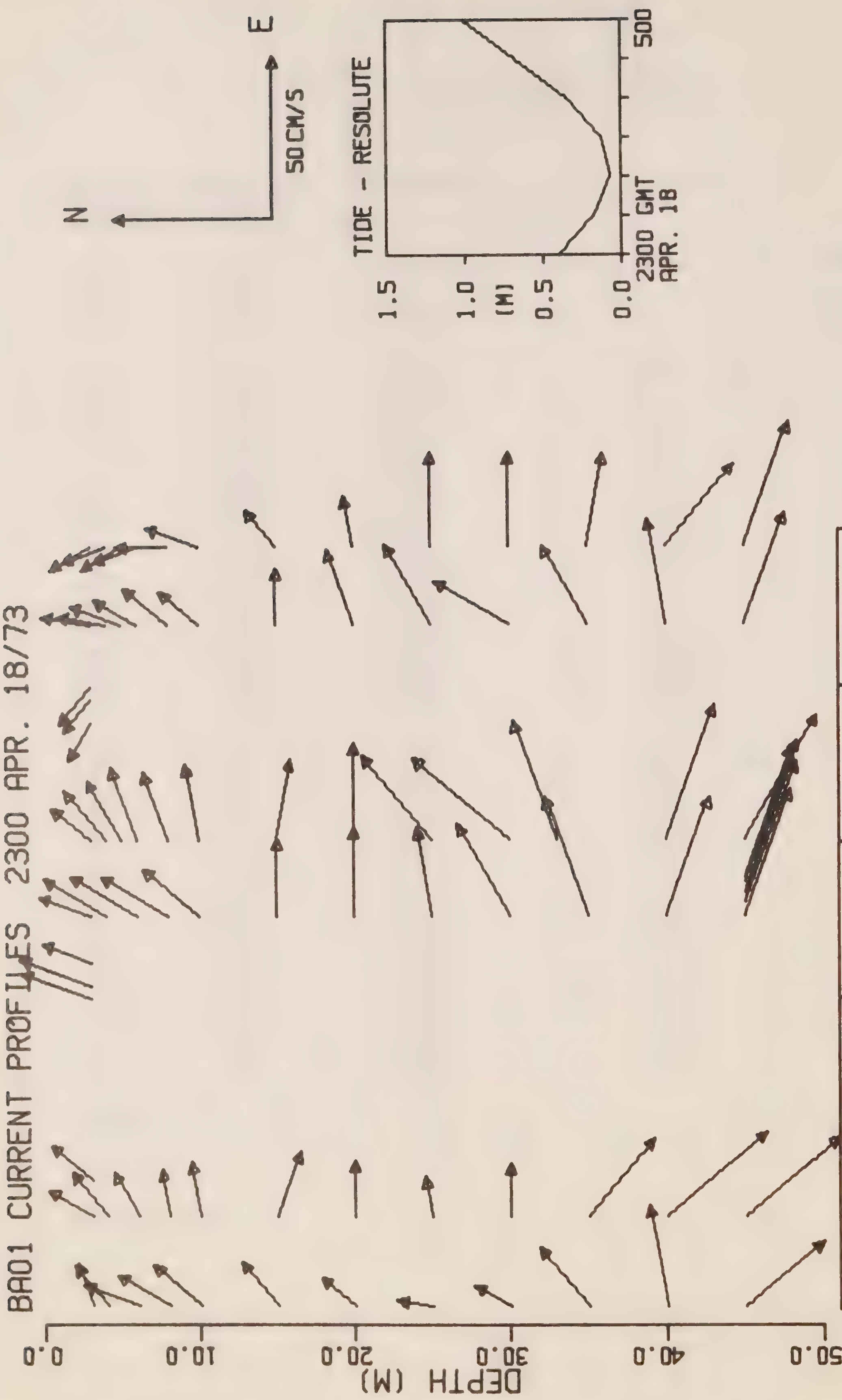
STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 18,1973	2:15	3.0	18.	170.	-18.	3.
		4.0	18.	170.	-17.	3.
		6.0	20.	170.	-19.	3.
		8.0	23.	170.	-22.	4.
		10.0	22.	190.	-21.	-4.
		15.0	21.	190.	-20.	-4.
		20.0	22.	190.	-22.	-4.
		25.0	23.	190.	-22.	-4.
		30.0	21.	190.	-20.	-4.
		35.0	23.	190.	-22.	-4.
		40.0	32.	190.	-32.	-6.
		45.0	33.	190.	-33.	-6.
APR. 18,1973	2:52	3.0	8.	0.	8.	0.
		4.0	10.	0.	10.	0.
		6.0	11.	0.	11.	0.
		8.0	14.	190.	-14.	-3.
		10.0	16.	200.	-15.	-5.
		15.0	22.	200.	-20.	-7.
		20.0	16.	200.	-15.	-6.
		25.0	19.	190.	-18.	-3.
		30.0	20.	190.	-20.	-3.
		35.0	25.	190.	-24.	-4.
		40.0	28.	190.	-28.	-5.
		45.0	28.	200.	-27.	-10.
APR. 18,1973	3:30	3.0	13.	350.	13.	-2.
APR. 18,1973	3:35	3.0	12.	350.	12.	-2.
APR. 18,1973	3:43	3.0	11.	0.	11.	0.
APR. 18,1973	3:52	3.0	11.	350.	11.	-2.
APR. 18,1973	3:55	3.0	11.	350.	11.	-2.


BA01 CURRENT PROFILES 1400 APR. 18/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
1400 GMT
APR. 18
2000

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 18,1973	4: 0	3.0	12.	350.	12.	-2.
APR. 18,1973	4:15	3.0	11.	350.	11.	-2.
APR. 18,1973	14:32	2.5	0.	130.	0.	0.
		3.0	3.	140.	-2.	2.
		4.0	5.	170.	-5.	1.
		5.0	4.	170.	-4.	1.
		6.0	4.	170.	-4.	1.
		8.0	4.	170.	-4.	1.
		10.0	3.	180.	-3.	0.
		15.0	0.	120.	0.	0.
		20.0	7.	240.	-3.	-6.
		25.0	9.	270.	-0.	-9.
		30.0	14.	300.	7.	-12.
		35.0	5.	250.	-2.	-5.
		40.0	11.	230.	-7.	-8.
		45.0	11.	200.	-11.	-4.
APR. 18,1973	15:12	3.0	2.	260.	-0.	-2.
		4.0	2.	230.	-1.	-2.
		5.0	3.	220.	-2.	-2.
		6.0	0.	230.	0.	0.
		8.0	0.	20.	0.	0.
		10.0	0.	10.	0.	0.
		15.0	0.	260.	0.	0.
		20.0	7.	250.	-2.	-6.
		25.0	13.	250.	-5.	-13.
		30.0	11.	260.	-2.	-11.
		35.0	13.	240.	-6.	-11.
		40.0	13.	230.	-8.	-10.
		45.0	10.	210.	-9.	-5.



BA01 CURRENT PROFILES 2300 APR. 18/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
5.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
2300 GMT
APR. 18
500

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

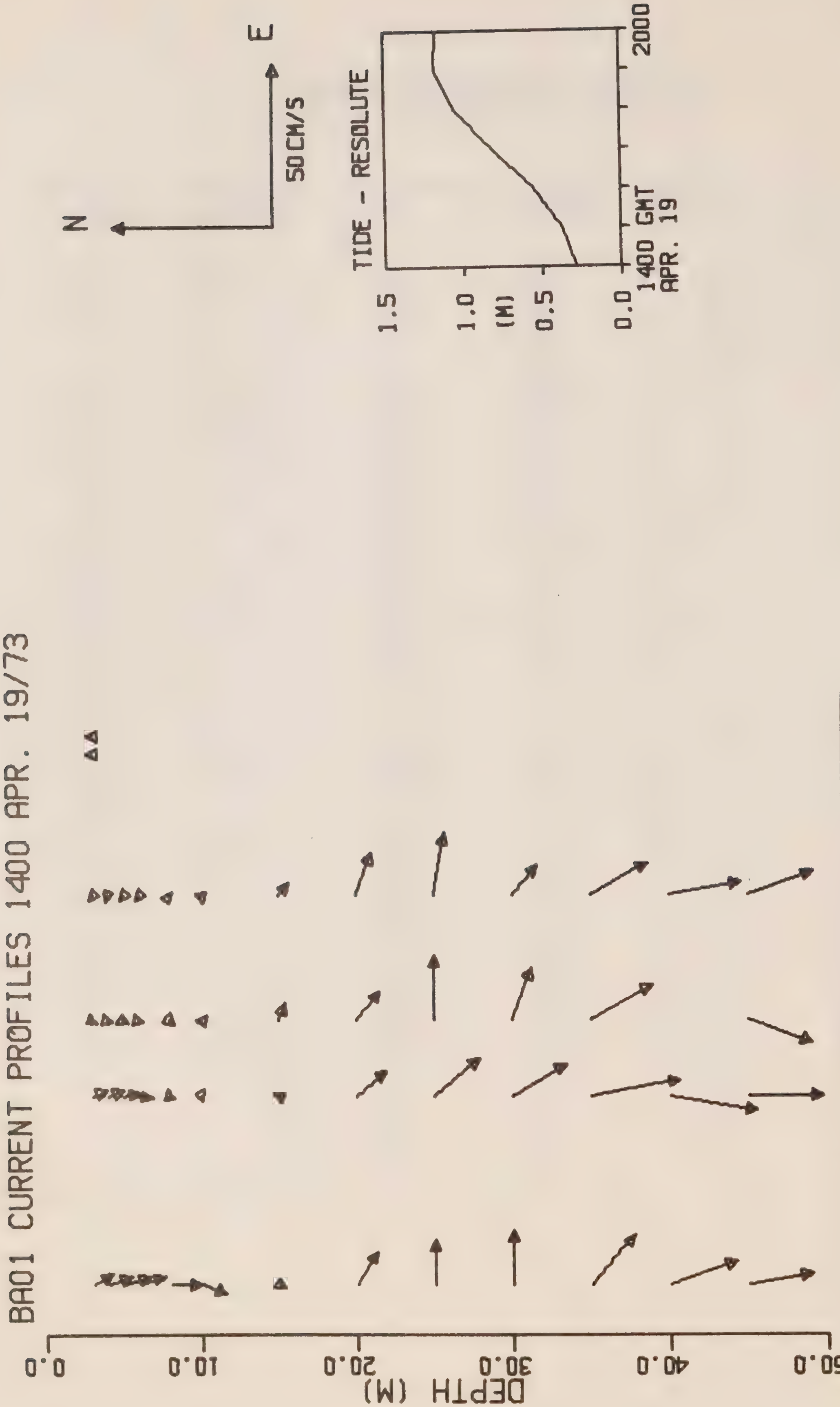
		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 18,1973	23: 1	3.0	13.	70.	4.	12.
		4.0	15.	50.	10.	12.
		6.0	18.	20.	16.	6.
		8.0	18.	30.	16.	9.
		10.0	19.	40.	14.	12.
		15.0	17.	50.	11.	13.
		20.0	13.	40.	10.	8.
		25.0	10.	10.	10.	2.
		30.0	12.	30.	10.	6.
		35.0	23.	50.	15.	18.
		40.0	31.	80.	5.	31.
		45.0	31.	140.	-24.	20.
APR. 18,1973	23:36	3.0	14.	30.	12.	7.
		4.0	16.	50.	11.	13.
		6.0	14.	60.	7.	12.
		8.0	13.	80.	2.	13.
		10.0	16.	80.	3.	16.
		15.0	21.	110.	-7.	19.
		20.0	16.	90.	0.	16.
		25.0	11.	80.	2.	11.
		30.0	15.	90.	0.	15.
		35.0	31.	130.	-20.	24.
		40.0	40.	140.	-31.	26.
		45.0	38.	140.	-29.	24.
APR. 18,1973	23:50	3.0	15.	40.	12.	10.
APR. 19,1973	1: 0	3.0	22.	20.	21.	8.
APR. 19,1973	1: 5	3.0	23.	20.	21.	8.
APR. 19,1973	1:14	3.0	15.	20.	14.	5.

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 19,1973	1:32	3.0	16.	20.	15.	5.
		4.0	22.	30.	19.	11.
		6.0	23.	30.	20.	12.
		8.0	23.	30.	20.	12.
		10.0	22.	40.	17.	14.
		15.0	23.	90.	0.	23.
		20.0	27.	90.	0.	27.
		25.0	27.	80.	5.	26.
		30.0	32.	60.	16.	28.
		35.0	39.	70.	13.	36.
		40.0	39.	110.	-13.	36.
		45.0	41.	110.	-14.	39.
APR. 19,1973	1:37	45.0	46.	110.	-16.	44.
APR. 19,1973	1:41	45.0	44.	110.	-15.	41.
APR. 19,1973	1:45	45.0	46.	110.	-16.	44.
APR. 19,1973	1:47	45.0	42.	110.	-14.	40.
APR. 19,1973	2: 1	3.0	14.	40.	11.	9.
		4.0	19.	50.	12.	15.
		5.0	21.	60.	10.	18.
		6.0	23.	70.	8.	22.
		8.0	22.	70.	7.	20.
		10.0	23.	80.	4.	23.
		15.0	25.	100.	-4.	24.
		20.0	29.	90.	0.	29.
		25.0	33.	50.	22.	26.
		30.0	39.	40.	30.	25.
		33.0	39.	70.	13.	36.
		40.0	44.	110.	-15.	42.
		45.0	44.	120.	-22.	38.
APR. 19,1973	2:46	3.0	12.	300.	6.	-10.

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

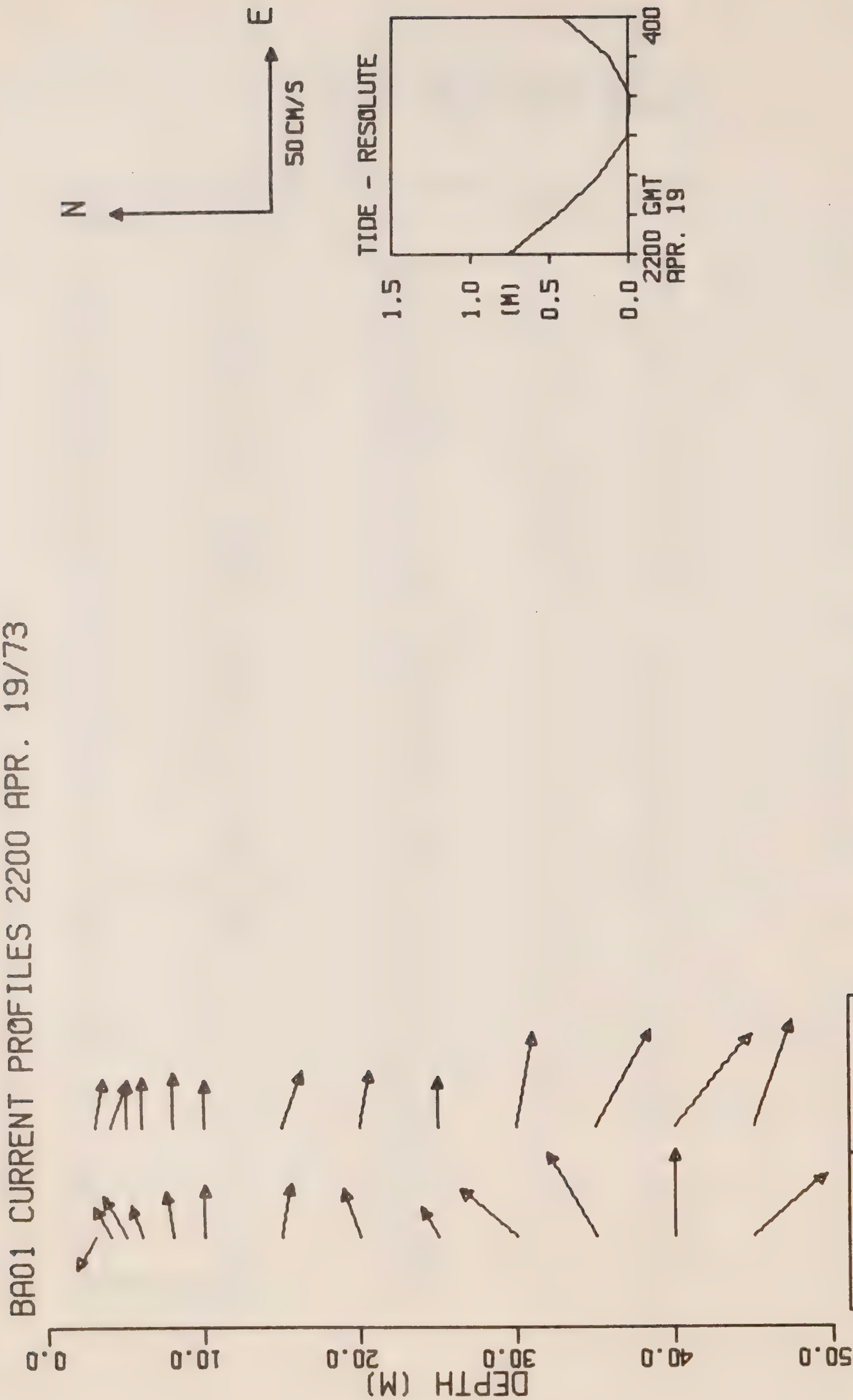
		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 19,1973	2:55	3.0	12.	310.	8.	-9.
APR. 19,1973	3: 0	3.0	14.	310.	9.	-11.
APR. 19,1973	3:24	3.0	14.	10.	14.	2.
		4.0	14.	10.	14.	2.
		5.0	15.	20.	15.	5.
		6.0	14.	30.	12.	7.
		8.0	16.	40.	13.	11.
		10.0	14.	40.	11.	9.
		15.0	16.	90.	0.	16.
		20.0	24.	70.	8.	22.
		25.0	28.	60.	14.	24.
		30.0	26.	30.	22.	13.
		35.0	27.	60.	14.	24.
		40.0	32.	80.	6.	32.
		45.0	36.	110.	-12.	34.
APR. 19,1973	3:54	3.0	13.	330.	11.	-6.
		4.0	13.	340.	12.	-4.
		5.0	13.	330.	11.	-6.
		6.0	13.	340.	12.	-4.
		8.0	15.	0.	15.	0.
		10.0	16.	20.	15.	5.
		15.0	13.	50.	9.	10.
		20.0	14.	80.	3.	14.
		25.0	28.	90.	0.	28.
		30.0	28.	90.	0.	28.
		35.0	28.	100.	-5.	28.
		40.0	32.	130.	-21.	25.
		45.0	40.	110.	-14.	38.



BA01 CURRENT PROFILES 1400 APR. 19/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
3.0
4.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
1400 GMT
APR. 19
2000

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

		DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 19,1973	14:13	3.0	5.	150.	-4.	3.
		4.0	6.	160.	-5.	2.
		5.0	7.	160.	-6.	2.
		6.0	7.	160.	-6.	2.
		8.0	8.	180.	-8.	0.
		10.0	6.	200.	-6.	-2.
		15.0	0.	210.	0.	0.
		20.0	11.	120.	-5.	9.
		25.0	13.	90.	0.	13.
		30.0	16.	90.	0.	16.
		35.0	19.	130.	-12.	15.
		40.0	21.	160.	-19.	7.
		45.0	19.	170.	-18.	3.
APR. 19,1973	15:26	3.0	3.	160.	-3.	1.
		4.0	4.	160.	-3.	1.
		5.0	4.	170.	-4.	1.
		6.0	3.	190.	-3.	-0.
		8.0	0.	200.	0.	0.
		10.0	0.	250.	0.	0.
		15.0	0.	20.	0.	0.
		20.0	11.	140.	-8.	7.
		25.0	17.	140.	-13.	11.
		30.0	18.	150.	-16.	9.
		35.0	27.	170.	-26.	5.
		40.0	26.	190.	-26.	-5.
		45.0	22.	180.	-22.	0.
APR. 19,1973	15:55	3.0	0.	200.	0.	0.
		4.0	0.	190.	0.	0.
		5.0	0.	210.	0.	0.
		6.0	0.	190.	0.	0.
		8.0	0.	220.	0.	0.
		10.0	0.	10.	0.	0.
		15.0	4.	110.	-1.	4.
		20.0	10.	130.	-7.	8.
		25.0	19.	90.	0.	19.
		30.0	16.	110.	-5.	15.
		35.0	21.	150.	-18.	10.
		45.0	20.	200.	-18.	-7.



BA01 CURRENT PROFILES 2200 APR. 19/73
DEPTH (M)
0.0
10.0
20.0
30.0
40.0
50.0
0.0
1.0
2.0
N
E
50 CM/S
TIDE - RESOLUTE
1.5
1.0
(M)
0.5
0.0
2200 GMT
APR. 19
400

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

	DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 19,1973 16:43	3.0	0.	310.	0.	0.
	4.0	0.	290.	0.	0.
	5.0	0.	310.	0.	0.
	6.0	0.	310.	0.	0.
	8.0	0.	130.	0.	0.
	10.0	0.	20.	0.	0.
	15.0	4.	130.	-2.	3.
	20.0	13.	110.	-4.	12.
	25.0	19.	100.	-3.	18.
	30.0	11.	130.	-7.	8.
	35.0	19.	150.	-17.	10.
	40.0	21.	170.	-21.	4.
	45.0	20.	160.	-19.	7.
APR. 19,1973 17:38	3.0	0.	0.	0.	0.
APR. 19,1973 17:45	3.0	0.	0.	0.	0.
APR. 19,1973 22:29	3.0	10.	0.	10.	0.
	4.0	9.	60.	5.	8.
	5.0	13.	60.	6.	11.
	6.0	9.	70.	3.	8.
	8.0	13.	80.	2.	13.
	10.0	14.	90.	0.	14.
	15.0	15.	100.	-3.	15.
	20.0	14.	70.	5.	14.
	25.0	9.	60.	4.	8.
	30.0	22.	40.	17.	14.
	35.0	29.	60.	14.	25.
	40.0	26.	90.	0.	26.
	45.0	28.	140.	-22.	18.

STATION BA01 BARROW STRAIT
CURRENT PROFILE(S)

	DEPTH (M)	SPEED (CM/S)	DIRECTION	NS COMP (CM/S)	EW COMP (CM/S)
APR. 19,1973 23:11	3.0	14.	100.	-2.	14.
	4.0	14.	110.	-5.	13.
	5.0	13.	90.	0.	13.
	6.0	14.	90.	0.	14.
	8.0	15.	90.	0.	15.
	10.0	13.	90.	0.	13.
	15.0	17.	110.	-6.	16.
	20.0	16.	100.	-3.	16.
	25.0	14.	90.	0.	14.
	30.0	28.	100.	-5.	28.
	35.0	33.	120.	-17.	29.
	40.0	36.	130.	-23.	28.
	45.0	33.	110.	-11.	31.

Pacific Marine Science Report 78-5

Canada

HISTORICAL STUDY OF TSUNAMIS - AN OUTLINE

by

Sydney O. Wigen

INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
Sidney, B.C.

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Pacific Marine Science Report 78-5

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January 1978

This is a manuscript which has received only limited circulation. On citing this report in a bibliography, the title should be followed by the words "UNPUBLISHED MANUSCRIPT" which is in accordance with accepted bibliographic custom.

ABSTRACT

This paper is intended to set forth objectives for a Historical Study of Tsunamis; to summarize the preparatory work carried out at the International Tsunami Information Center; and to provide a procedural outline for those participating in the Study.

From Basilan Island, Philippines
August 1976

"When the tsunami broke down our homes our people tried to go to higher ground. If the water was above our knees a man could hardly stand, and women and children did not have a chance".

HISTORICAL STUDY OF TSUNAMIS - AN OUTLINE

Letter of Introduction

During the final months of his posting as Associate Director of the International Tsunami Information Center, Mr. Sydney O. Wigen has undertaken preparatory work on behalf of ITIC for a comprehensive Historical Study of Tsunamis.

The Center endorses this Study, and authorizes Mr. Wigen to continue to co-ordinate and direct it on behalf of the Center.

Bringing the Historical Study of Tsunamis to a successful fulfillment will only be possible with the co-operative participation of many researchers. From it may come a systematic body of knowledge that could be applied to mitigating the effects of tsunamis, and protection of people and property in coastal communities throughout the world.

Mr. Wigen is completing his posting as Associate Director of ITIC on November 30, 1977 and is returning to Canada where he is continuing in tsunami programs.

Questions, comments and expressions of interest in participating in the Historical Study of Tsunamis may be sent to ITIC, or directly to Mr. Wigen at his new address; Institute of Ocean Sciences; P.O. Box 6000; 9860 W. Saanich Road; Sidney, B.C., Canada; V8L 4B2.

Sincerely,

George Pararas-Carayannis
Director, ITIC

HISTORICAL STUDY OF TSUNAMIS - AN OUTLINE

This paper is intended to set forth objectives for a Historical Study of Tsunamis; to summarize the preparatory work carried out at the International Tsunami Information Center; and to provide a procedural outline for those participating in the Study.

Introduction

In a recent study by the author, the marigrams from the tide station at Tofino, British Columbia, were examined for evidence of 70 known large tsunamis originating in various parts of the Pacific. Twenty-one of these were found to have produced identifiable tsunamis, and most of these had not been previously reported. It was recognized that many additional tsunamis could have reached and been recorded at Tofino, and that these could be uncovered by a systematic search of a large number of potentially tsunamigenic events. Similarly, a study of the marigrams from any other tidal station would yield an unknown number of previously unreported tsunami records. A systematic search through tide records of many stations and the compiling of standardized data would provide a foundation for tsunami research that would have direct application for the improvement of tsunami warning systems.

With this in mind, preparatory work for a systematic and comprehensive Historical Study of Tsunamis has been carried out at the International Tsunami Information Center, and is outlined in this paper. The full Study can be brought to successful fulfillment with the co-operation of many researchers, each investigating the tsunami records from a single tidal station. It is envisaged that each of the research studies will provide a body of knowledge not presently available, and the composite of many such studies will be a data source for ocean-wide research.

Objectives

About 100,000 people are known to have died as a result of tsunamis in the last 100 years, the period of time to be covered by this Study. Most died for lack of knowledge and preparedness. Researchers may recognize in the following statement of objectives, the potential of the Study to mitigate some of the disastrous effects of tsunamis, and how their own participation will add to the body of knowledge, assist in the development of regional and International Tsunami Warning Systems, and contribute to the protection of property and resources and the saving of lives.

Here are the principal objectives, as related to each specific station.

1. Identify whether the coastal area at which the station is located is vulnerable to destructive tsunamis, and establish the frequency with which tsunamis of any magnitude may be expected.

2. Define which tsunami-generating regions threaten the coastal area, and which do not.

3. Determine the actual travel times of tsunamis from generating regions, and the number of hours after arrival that the waves may have their maximum impact.

4. Evaluate how accurately the gauge station records tsunamis affecting the adjacent coast, and determine whether its capability could be improved.

Here are the principal objectives, related to the collective results of the Historical Study of Tsunamis.

1. Collect and systematize as complete a record as possible of tsunamis, and standardize data, as a foundation for research.

2. Identify the directions in which generated tsunamis propagated; find whether the direction of propagation from any source was consistent; and define the directions in which each did not propagate.

3. Develop a body of data on actual travel times of tsunamis, for use in calibrating travel time charts used in warning systems.

4. Provide data for calibrating numerical models of tsunamis in the ocean.

5. Identify earthquakes that produced tsunamis, and ones of similar magnitude that apparently did not. Characteristics of their seismic records may be recognized that could identify the tsunami threat of future earthquakes at the time of their occurrence.

The collected data from the Historical Study of Tsunamis will be provided to the World Data Centers for Tsunamis. In this way any researcher will have access to it for further investigation.

Preparatory Work

The basic procedure adopted for the Study has been to compile a list of earthquakes whose magnitude, depth, and location would make them potentially tsunamigenic; to supplement these events with other known or suspected tsuanmis; and to define standardized procedures for data collection and compilation. Tsunami catalogues by Iida, Cox, and Pararas-Carayannis, 1967 and by Soloviev, 1974 and 1975, provided most of the records of past tsunamis, and these were supplemented by records of the Honolulu

Observatory (now the Pacific Tsunami Warning Center), and by a number of papers dealing with specific regions. A paper by S. J. Duda, and publications of the International Seismological Centre and the National Earthquake Information Service were the primary sources of earthquake data. Regional data were received as well from New Zealand and from Canada.

The preparation of the list of potentially tsunamigenic events required a number of arbitrary judgements, so the procedures for selection are outlined below.

Arbitrarily the list commences in 1883, the year of the Krakatoa explosion and tsunami. For the first 14 years, 1883-1896, adequate earthquake records do not appear to be available, and only 18 events were selected from the tsunami catalogues.

For the period 1897-1964, the list of earthquakes compiled by S. J. Duda was recommended by seismologists as being the most reliable. This list included all earthquakes of magnitude 7.0 and larger, about 1300 in all for the 68 years. From these were deleted earthquakes that appeared to be too far inland to be tsunamigenic, and those with a focal depth of greater than 100 km. Events from tsunami catalogues were added, resulting in about 1020 events for the 68 years. In setting criteria to keep the Study to a manageable size and delete earthquakes most unlikely to be tsunamigenic, a few actual tsunamis will have been missed. In four cases the tsunami catalogues restored events that had been deleted from the earthquake list because of focal depth.

From 1965 through 1974 the semiannual list of large earthquakes published by the International Seismological Centre (ISC) was used. Each edition includes a list of major earthquakes, magnitude 5.5 and over. The ISC magnitude is given, plus magnitudes established by other sources for the same event. Typically

there is a disparity of .5 to 1.0 in the magnitudes, with ISC and United States Coast and Geodetic Survey (USCGS) 1965-1970, or National Earthquake Information Service (NEIS) 1971-1974 being low, but in close agreement, and others being relatively high. By comparison with events in the tsunami catalogues it appeared appropriate to select earthquakes with an ISC or NEIS magnitude of 6.0 or larger, and about 400 events were included for this 10 year period.

For 1975 and 1976 the principal source of information was the record of earthquakes investigated by Honolulu Observatory, and 50 events were included. For all of the above periods the NEIS catalogue of earthquakes was a valuable corroborative data source, particularly when times and positions from other records were in disagreement.

The list of events has been prepared in two forms, a Chronological List and an Area List. Examples appear as Tables 1 and 2. The Chronological List defines the events, in time sequence. The Area List provides a form for tabulating standard information about any tsunami from these events, as recorded at a particular tide gauge station.

In the Chronological List, the following abbreviations are used to designate principal data source for each event:

TC Preliminary Catalogue of Tsunamis in the Pacific
NG Science in New Guinea 4(1) 1976
DU S. J. Duda List
NZ Communication from New Zealand
CA Communication from Canada
SC International Seismological Centre
HO Honolulu Observatory

LIST OF EARTHQUAKES

YEAR	MO	DA	HR	MN	SEC	LAT	LONG	DEPTH	MAG	SOURCE & AREA
1883	3	12								TC03
1883	8	26	18	42		06.7S	105.4E			TC12
1883	8	27	02	59		06.7S	105.4E			TC12
1883	10	6	18	30		59.4N	153.4W			TC05
1885	4	30	05	00		02.5S	123.5E			TC12
1885	11	12	07	40						TC01
1885	11	19								TC04
1887	7	9	00	00						TC04
1888	3	12	20	00		05.5S	148.1E			NG13
1889	9	6	12	00		01.0N	126.2E	70	8.00	TC12
1889	9	9				02.2N	125.4E			TC11
1892	6	7				03.7N	123.5E			TC11
1893	6	3	17	27		43.4N	145.5E			TC06
1894	3	22	10	23		42.3N	145.1E		7.90	TC07
1895	3	6	08	40		08.5S	150.0E		7.50	NG13
1895	10	14	16	20						TC04
1896	1	9	13	17		36.0N	141.0E		7.30	TC07
1896	6	15	10	33		39.6N	144.2E		7.60	TC07
1897	2	20	20	20		38.1N	141.5E		7.8	TC07
1897	3	14	22	30		06.8S	120.8E	15	5.50	TC12
1897	6	20	09	00		16.5N	095.0W			TC03
1897	8	5	00	10		38.0N	143.7E		7.7	TC07
1897	9	10	21	40		60.0N	140.0W		8.6	TC05

Table 1. Example of Chronological List of Tsunamis.

AREA OF ORIGIN: 01. CHILE-PERU

GAUGE SITE RECORDED:

YEAR	MO	DAY	HOUR (U.T.)	LAT.	LONG.	MAG	DEPTH	EST.AR. (U.T.)	ACTUAL ARRIVAL	FIRST MOTION	SECOND MOTION	MAXIMUM WAVE ARRIVAL & HT	PERIOD	COMMENTS
1885	11	12	0740											
1903	9	26												
1903	12	7	1509	28.5S	071.0W	6.50								
1906	5	7												
1906	8	17	0040	33.0S	072.0W	8.60	33							
1906	12	26	0653	18.0S	071.0W	7.90	33							
1908	12	12	1208	14.0S	078.0W	8.20	33							
1909	6	8	0546	25.0S	073.0W	7.60	33							
1913	7	28	0539	17.0S	074.0W	7.00								
1913	8	6	2214	17.0S	074.0W	7.90	33							
1914	1	12												
1918	5	20	1755	28.5S	071.5W	7.90	80							
1918	5	25	1929	30.5S	092.5W	7.00	60							
1918	12	4	1148	26.0S	071.0W	7.25	33							
1920	3	20	1831	35.0S	110.0W	7.00	33							
1920	8	20												
1922	1	6	1411	16.5S	073.0W	7.20	33							
1922	11	7	2300	28.0S	072.0W	7.00	33							
1922	11	11	0433	28.5S	070.0W	8.40	33							
1923	2	17												
1923	3	4												
1923	5	4	2227	28.8S	071.8W	7.00	60							

Table 2. Example of Area List of Tsunamis.

The following numbers are used to designate which area the events have been assigned to in the Area List:

01	Chile-Peru	10	Philippine Trench
02	Caribbean	11	S. China, Sulu, Celebes Seas
03	Ecuador-Mexico	12	Java Trench - Banda Sea
04	Baja California-Alaska Panhandle	13	Bismarck Arch.-New Hebrides
05	Gulf of Alaska-Aleutians	14	Tasman Sea
06	Kamchatka-Kuril Islands	15	Tonga-Kermadec
07	Mariana-Japan Trench	16	Hawaii
08	Sea of Japan	17	Atlantic
09	Ryukyu Trench	18	Mediterranean
		19	Indian Ocean

The Chronological and the Area Lists were revised and corrected until August 19, 1977, and were then produced by computer printout with that date entered. Rather than continuing to make revisions, additional events warranting examination will be incorporated into a supplementary list, or lists.

Procedural Outline

A copy of the Chronological List and the Area List will normally accompany this outline paper. If not, a copy may be requested from the International Tsunami Information Center, or from the author. In the event that an additional tidal station is being studied, please request a copy of the Area List, or both lists if so required, rather that produce a duplicate. Only in this way will ITIC be able to co-ordinate the Study.

A participating researcher may choose to produce a technical paper presenting the standardized tsunami data, with supporting documentation about the tidal characteristics of the station being studied. In such a case, an analysis of the tsunamis recorded at the station could be subsequently

published. Alternately, the data and whatever analysis the researcher wishes to undertake could be the subject of a single paper.

Publication would be the prerogative of the author, but it would be understood that the paper containing the technical data could be published as well by the International Tsunami Information Center as one of a report series. If any of the tsunamis that occurred in the vicinity of the station caused flooding or damage, descriptive information about their effects would be a useful part of the paper. First hand accounts from people who have seen and experienced the tsunamis, newspaper reports and photographs of damaged areas, and records from surveys that defined the limits of inundation would all contribute to the value of the paper.

Principal tidal values for the station should be an integral part of the paper, and the maximum crests of damaging tsunamis should be related to the tidal elevations. The agency operating the tidal station may be able to supply the tidal values, the most useful of them being:

> Bench mark and datum reference, to which tidal elevations are referred.
> Mean sea level, present value, and values throughout the period of gauge operation.
> High and low waters, for mean tide and for large tide.
> Extreme high and low waters that have been recorded, other than during tsunamis.
> Harmonic constants for tidal predictions, and the analysis period used in calculating them.

Characteristics of the gauge station itself, both present and throughout its history, will be needed to fully understand tsunamigrams from the station. Braddock and others have shown

that for float operated tide gauges, stilling well intakes may restrict the tsunami movements inside the wells. Mechanical performance of the instruments may also modify the recording of the waves.

Coastal features and water depths at the gauge site and on the approaches from the ocean are essential features in understanding the tsunami response. An inlet or harbour may amplify certain tsunami frequencies, or a lagoon with restricted access may diminish the tsunami at the gauge site. The gauge may be open to tsunamis approaching from some directions, and shadowed by coastal features and islands from others. Inclusion of portions of selected charts showing the gauge location and approaches will therefore be essential to the technical portion of the paper.

For extraction of tsunami data, the Chronological List provides a quick reference to the marigrams needing to be studied, and the Area List, a form for the entering of standardized data.

In using the Area List, tsunami travel time charts may be used to calculate the number of hours for the waves to reach the gauge station from each generating area. A first approximation of estimated arrival, in Universal Time, can be entered in Column 1.

For locations other than the Pacific Ocean, it may be necessary to calculate or prepare a map of travel times, working outward from the gauge station, using the long wave travel formula $V = \sqrt{gh}$. Table 3 gives selected travel times, in nautical miles per hour, for selected depths in meters and in fathoms; and from these a travel time scale can be prepared, appropriate to the hydrographic chart being used. For extension of this tabulation, depths may be multiplied or divided by a factor of 100, and velocities by a factor of 10.

Depth Fathoms	Tsunami Speeds Nautical Miles * Per Hour	Depth Meters	Tsunami Speeds Nautical Miles Per Hour
5000	582	10000	608
4000	520	8000	544
3000	451	6000	471
2000	368	4000	385
1500	319	3000	333
1000	260	2000	272
750	225	1500	236
500	184	1000	192
300	142	600	149
200	116	400	122
100	82	200	86

Table 3. Tsunami Speeds

If the commencement of a tsunami can be identified, its time of arrival is shown in column 2, to the nearest minute.

The first motion, column 3, is the initial rise or fall given in centimeters; 10R for example would indicate an initial rise of 10 centimeters. The second motion, the following fall or rise, is given in column 4. All tsunami wave heights are given with the contribution of the tide removed. This is done by measuring each trough or crest as the maximum displacement from an assumed tide that could have occurred had there been no tsunami.

The maximum wave, its time of arrival or commencement, and its height from crest to trough, or trough to crest, are given in column 5. When more than one wave has the same maximum height the time of the last one is listed. This value serves as an indicator of the amount of time after the arrival of a tsunami at the station that it may provide its greatest impact or threat.

*On a chart, 60 nautical miles = 1° latitude

The tsunami period in column 6 is the average time interval for a series of crests.

Short comments in column 7 will typically be:

NO RECORD	if there appears to be no marigram.
NO ACCESS	if the researcher cannot obtain a particular marigram.
UNCHECKED	if a search for a tsunami or group of tsunamis is unwarranted.
UNCLEAR	if evidence of a tsunami is sufficiently doubtful that some columns must be left blank.
GAP or GAPS	if there are one or several significant breaks in the analogue trace at the time of the tsunami.

It should be noted that in previous extractions of tsunami data, the contribution of normal tide to the rise or fall of waves has almost never been removed. Values arrived at in the Study will therefore seldom be identical to those that have previously been determined or published. Making this tidal correction is essential for some applications of the Historical Study of Tsunamis. The procedure for removal of tide is shown in Figure 1.

The solid line represents the recorded water level, with the tsunami commencing at point A. The dashed line is a smoothed curve representing the tide that could have occurred had their been no tsunami. The smoothed curve is a by-eye interpolation that places about equal areas of the actual tsunami trace above and below the curve. It follows the form indicated by the normal tide in the days immediately preceding the tsunami. Effectively it combines the predicted tide, plus meteorological contributions with periods significantly longer than the dominant tsunami periods.

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In the example shown, this initial motion is a rise measured by V-B (not V-A). The second motion is the fall given by (V-B) + (C-X). The maximum wave is the fall (Y-D) + (E-Z), the greatest sum of two consecutive displacements from the tide curve. This is so even though the preceding rise, with tide included, had a greater range. The time of arrival of the maximum wave is the time of point Y. If a tsunami record has several maximum waves of equal height, the time listed is the time of the latest one.

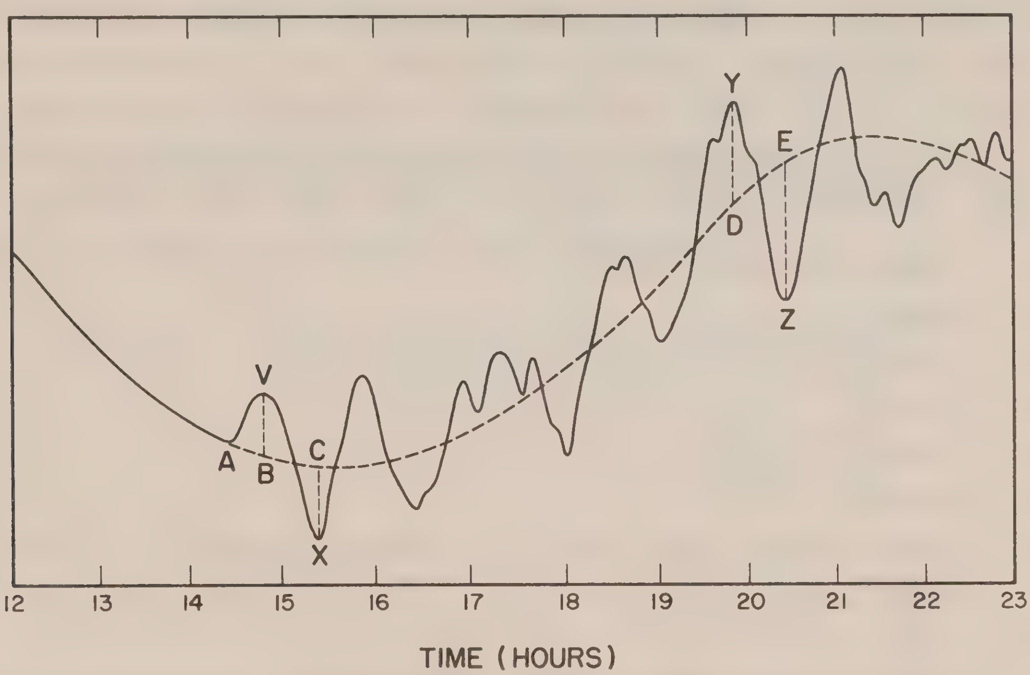

Figure 1. Marigram with tsunami.

Data from the individual studies will be computerized for ITIC and the World Data Centres, to facilitate tsunami research. A researcher in the Study may submit data on the Area List, original or copy, for keypunching by ITIC. Since number styles vary, keypunching will be facilitated if each person filling in data enters the numbers 0 1 2 3 4 5 6 7 8 9 across the top of a page in his own handwriting.

For researchers producing data from the Historical Study on 80-column computer cards the following is the standard format:

Columns	Header Card
1-31	HISTORICAL STUDY OF TSUNAMIS AT
32	Blank
33-64	Place name
65	Blank
66-69	Initials or designation of researcher
70	Blank
71-80	Ten digit INST Reference Number of tidal station (see below)

Data Cards, for Information Compiled on Area List

1-10	INST Reference Number
11	Blank
12-15	Initials or designator of researcher
16	Blank
17-18	Area of origin
19	Blank
20-31	Year, month, day, hour, of event, exactly as shown on Area List.
32	Blank
33-34	Day of actual arrival, if different from column 26 & 27, or otherwise leave blank.
35	Blank
36-39	Hour and minute of arrival
40	Blank
41-45	First motion, in centimeters, maximum of four digits, followed by R (rise) or F (fall)
46	Blank
47-51	Second motion (as above)
52	Blank
53-54	Date of commencement of maximum wave, if different from 33-34 or 26-27
55	Blank

56-59	Hour and minute of commencement of maximum wave
60	Blank
61-65	Maximum wave height, 4 digits plus R or F
66	Blank
67-69	Mean period crest-crest, in minutes
70	Blank
71-80	Comments

The INST Reference defines the location of the tide gauge by a 10-digit number. The first digit defines in which of four earth sectors the station is located; the next four designate the latitude, in degrees and minutes, with fraction of a minute deleted; the last five, similarly the longitude. The digits for sector designation are as follows:

Digit 1	Northern and eastern hemispheres
2	Northern and western hemispheres
3	Southern and western hemispheres
4	Southern and eastern hemispheres

As an example, the Honolulu tide gauge, Lat. 21^{o} 18.39'N, Long. 157^{o} 52.04W will be disignated 2/2118/15752. The / may be used in printout for easier reading, but not in computer storage.

Researchers are encouraged to write the author for clarification of any doubtful point, and to offer suggestions relating to any aspect of the Study. It is expected that research projects in the Study will be proceeding concurrently, and an interchange of ideas among participants will increase the overall effectiveness of the Historical Study of Tsunamis.

Conclusion

The potential for loss of life and damage to property has multiplied since March 1964, the time of the last disastrous

ocean-wide tsunami. More people now live and work in threatened coastal areas. New types of industrial facilities, superports, atomic power plants, and oil drilling and loading installations are sited in vulnerable locations.

At the same time, the possibilities for improved warning systems and tsunami preparedness have also been enhanced. Crystal pressure-actuated tide sensors are now rugged enough to be deployed on exposed coasts, and are not dependent on daily attention. Electronic techniques for data storage and manipulation at remote sites, and the facilities of satellite communication permit vital tsunami data to be brought rapidly and automatically to the warning centers. Protection and preparedness can be increased in the Pacific, and extended to tsunami threatened coasts in every ocean. Bringing together a systematic and comprehensive body of knowledge, through the Historical Study of Tsunamis, can provide a foundation for the research needed to make optimum use of the new technology.

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